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By E. P. Cathcart, C.B.E., M.D. Glasg., F.R.S.
REGIUS PROFESSOR OF PHYSIOLOGY, UNIVERSITY OF GLASGOW

I

In my two lectures[1] I propose to direct your consideration to the inadequacy of our knowledge concerning many of the fundamental processes governing the utilisation of food by the body. Few people realise how patchy our information really is about many of the problems of metabolism. Endless assumptions are made regarding the mode of utilisation and the quantitative needs for this and that item. Until we know a great deal more about the metabolic processes and the varying food requirements little real advance towards solid knowledge can be made. The confidence shown by some writers in their assertions is to me a matter of astonishment. No doubt these sensational assertions have a publicity value but they have no scientific value. They lead the lay public to believe that our reliable knowledge regarding food and nutrition is more profound than it is. As Burnet and Aykroyd have stated: "There is a science of nutrition which is the necessary basis of all practical action. But it cannot be said that fundamental principles in this field are as firmly established as, let us say, the principles which underlie the science of engineering. Many 'generally accepted' facts are in reality debatable; 'laws' which seemed fully established twenty years ago are open to question. In the absence of certainty on many points it is necessary to make shift with probability."

As it is impossible to deal here with the whole field of metabolism I have, apart from certain general remarks, confined my attention to the unknown or part of the unknown in connexion with the metabolism of protein and calcium. I selected protein because it holds an unique position in alimentation as almost the only source of the requisite nitrogen. I selected calcium because most attention has been, in modern times, devoted to a study of this mineral, because it is so intimately associated with the apparently static skeletal structure, and because so much weight has been laid on it as a kind of gauge of the adequacy of a diet.

I have deliberately entitled these lectures the mystery of alimentation because of our ignorance concerning the intricacies of the problem. We have, it is true, at our disposal innumerable relatively isolated facts of observation from many hands, with varied interpretations from many minds, some of them reliable, some of them of doubtful authenticity. And what a mystery alimentation is! Here daily before our eyes, by processes unseen and virtually unknown, a real transsubstantiation takes place. The dead inert matters which comprise the foodstuffs are converted into living flesh. And yet this living body has been likened to a machine. True, much of the material ingested is utilised as fuel to yield the energy which is required for the running of the organism just as a locomotive requires fuel. But even this transmutation is a mystery.

In our efforts to explain away these mysteries we have only too often over-simplified the problem. Like the decipherment of a defaced inscription we here and there recognise bits of letters and imagination fills in the gaps. Too often in face of our inability to probe the mystery further we give up striving. But this inability to pierce the darkness does not excuse investigators for forgetting the fundamental truth enshrined in "Occam's razor." *Entia non sunt multiplicanda præter necessitatem.* Of course there is the intuitive fore-vision of the genius but much more often the promulgation of a new force in the physiological realm is but the refuge of the mediocre mind.

Yet mystery or no mystery we have to deal with one of the very fundamentals of physiology—the proper provision, both quantitative and qualitative, of food. This provision certainly must not be insufficient and just as surely it must not if health is to be maintained be excessive. The effects of insufficiency are only too often apparent but in these days, in a country like ours, they are less dangerous than the end-results of excess.

THE STATE OF NUTRITION

I do not propose, important and essential though they be, to discuss again in detail the differences between alimentation and the state of nutrition. These are not synonymous terms. Alimentation is the provision of an adequate supply of essential foodstuffs and their metabolic disposal; the state of nutrition is a clinical state due, it is true, in part to the provision of food but one to which many other factors contribute very materially. I cannot accept the definition offered by Sir Robert McCarrison. He maintains that "nutrition is not a condition of body, but the function, the sum of the processes, that keeps it in condition, that is, in health." To me the state of good nutrition is an end-result of perfect environmental conditions, in the widest sense of the term, and is not merely a function. It is because the state of nutrition is a clinical condition that its assessment is so difficult and so open to subjective influence. In this assessment the *gestalt* attitude towards the individual examined is probably more determinative in the final decision of the assessor than is the meticulous weighing up of the different points of the physique.

I do not doubt that the provision of food inadequate qualitatively or quantitatively or both may lead to a state of malnutrition, but if the physical and psychical environment of the individual is not good the most perfect diet will not of necessity ensure good nutrition. A practical example which seems to lead to the same conclusion has recently been furnished in the final report of the Advisory Council on Nutrition of the Commonwealth of Australia, where the incidence of malnutrition in a group of children aged from six to twelve was found to be higher than in certain other groups studied. The report records that "the state of nutrition was correlated with calories, total protein, animal protein, income and expenditure upon food without revealing any significant facts."

The state of nutrition is a subtle state resulting from the coördinated activity of many diverse factors. Sir Robert Hutchison has rightly stated, in one of his addresses, that the "nutrition of any individual is not a fixed and static thing; on the contrary it is, like health, capable of various degrees."

We must not, moreover, lose sight of the reverse side of the picture, that over-alimentation may certainly lead to a state of malnutrition. Did not Dr. Lemery in his book on Foods and Drinkables which, so long ago as 1745, earned the warm commendation of Dr. Henry Plumptre, the then president of this

1. The Oliver-Sharpey lectures delivered before the Royal College of Physicians of London on March 12 and 14.

college, as being "entertaining, useful and worthy to be printed" state "if foods contribute so necessarily to the Preservation of Life and Health, they also produce the greatest Part of these Distempers to which we are subject, and many times, by the ill Use of them, cause even Death itself"?

INFLUENCE OF DIET ON GROWTH

Great emphasis has been laid on the improvement of physique which would necessarily result from improved food intake. The evidence seems to be clear that from whatever cause, and I hold the cause to be much more than the provision of food, there has been in many areas a steady increase in the heights and weights of school-children. Prof. R. A. Fisher in a personal communication in which he admits the increase of height in school-children added: "How far this change, if real, is reflected in adult size, and how far increase in adult size indicates increased constitutional well being, seem to me questions on which people are rather too ready to dogmatise." Now no-one would doubt that children who have been badly underfed both qualitatively and quantitatively will grow quicker if they are fed on an abundant and adequate diet. But this is far from saying that their ultimate growth, in height at least, will be materially increased. It must not be forgotten that in relation to the intake of food, as compared with many other animals, growth in man is extremely slow, and hence it follows that, generally speaking, food will have far less influence on growth than might be anticipated from experiments on small fast-growing laboratory animals. Mitchell has drawn attention to the danger of such deductions. He has stated: "It is a good thing that our complacency in the infallibility of a sort of Jeffersonian doctrine that all animals are created equal is being disturbed. A study of rodent nutrition is profitable in an understanding of mammalian nutrition only as its findings are periodically checked with other mammalian species." Fisher, I believe, put the matter fairly when he wrote that "experimentally the growth response to increased nutrition is found to be remarkably small and it is difficult to show that even this small response is of permanent developmental importance." I should have used the word alimentation in place of nutrition.

The President of this college pertinently asked some years ago: "Should we aim, as some enthusiasts would have us do, at feeding children in such a way as to produce the maximum growth and development of which each child is capable? If we succeed in this are we sure we have benefited the child? Does maximum growth make for health and longevity? There is certainly some evidence that it does not. . . . May it not be that the smaller and more wiry type fits in better with the conditions of urban life and a machine age?" Personally, I have no doubts that the medium-sized man has the advantage in modern industry. The day of the muscular Goliath has gone, he has been beaten in the race for a living by the smaller, more agile and often more alert David. In any case, even if we desired it, a definite general increase in height is not likely to be achieved for many years, if ever. There is the hereditary factor to be reckoned with, a factor which may be regarded as primary in governing growth. In one sense we must not forget that all growth is restricted.

Still, as I have already said, it is freely admitted that growth restriction in the young may result when they are given an inadequate diet or from some intercurrent malady. Yet there is good evidence to show that the ability to grow is retained for quite long periods. Smith has pointed out that the results of growth restriction in animals from adverse environmental conditions "is automatically compensated by subsequent growth at an accelerated rate." As Osborne and Mendel showed, this growth restriction might be kept up for the greater part of a rat's life—they did it for 532 days—yet the capacity to grow, when an adequate diet was given, was apparently unimpaired. It may be quite legitimately said that the study of these recovery effects has been carried out on rapidly growing animals of limited life span and that they do not represent what may happen in the young of the human species. No real experiments of this type can be carried out under strictly controlled conditions on children, but there is much indirect evidence to show that the recuperative powers of children are also great. Thus Palmer, from the results of his study of the school attendance records of 4000 elementary school-children, came to the conclusion that there was no significant association between height and weight and sickness. This finding was confirmed by Hardy, as the result of an intensive study of the life history of 415 boys and girls from ages six to twelve or thirteen and in the case of 115 boys and 124 girls—i.e., of 58 per cent. of the original group to age twenty. These children were ordinary representative pupils of an industrial urban community in regular attendance at school, who at one time or another suffered from the ordinary run of illnesses (colds of more than five days' duration were counted as illnesses). The average number of illness episodes per child (up to age twelve or thirteen) was six; 4 per cent. of the children had only one or two illnesses and 4 per cent. had as many as twelve. All anthropometric measurements made in childhood were again carried out at maturity, care being taken to see that any seasonal change in growth was allowed for. Hardy came to the conclusion that "among the 415 subjects in this investigation there is no indication of any general retarding influence of illness per se on physical growth." Incidentally, it may be remarked, it was found that the most frequently ill boys and girls tended to be both taller and heavier than the average subject and at no age, during childhood, were they found to be below the median stature of those children with fewest illnesses.

SHAKY FOUNDATIONS OF NUTRITIONAL KNOWLEDGE

The great pity is that this problem of food and nutrition in its practical aspects has become largely a political issue, debated by people with the vaguest of knowledge concerning the fundamentals. Too often if the subject of the food-supply is dealt with as a cold scientific study it is proclaimed that an attempt is being made, in some roundabout way, to deprive the needy. Such protagonists base their convictions on unscientific and as a rule ill-founded statements regarding the widespread extent of malnutrition in the country. They never stop to ask themselves on what data these wild statements are based. Are they real data obtained by reliable and unbiased investigators or are they not actual data but mere assumptions? One of the most dangerous of phrases in the English language is "Let us assume." Too soon, and often too willingly, it is forgotten that the basis of the statements which follow this specious opening are but assumptions and not well-founded data capable of demonstration and proof. The readers have neither the knowledge to criticise, in the first place, the data on which the assumptions have been based nor to judge of the scientific capacity of the person who has made the assumptions. In a subject like alimentation and nutrition the wildest of assertions may readily be supported on the basis that any-

thing germane to the issue and consistent with the assertion is evidence for the assertion, but there is just as certainly seldom any proof, that is evidence that is inconsistent with any alternative assertion. The majority of people prefer to take the side of a sentimental interpretation than of a scientific one, which, even if it is sympathetic to the issue, seems to lack the humanitarian outlook.

Perhaps the serious investigators are in large part to blame, for many have been far too prone to accept average data, particularly on the quantitative side, as being absolute standards, and to pass judgment on diets as being adequate or inadequate irrespective of the place of origin, mode of life, racial habits and so on of the consumers. Of course, average figures have a value, a very real value, but they have just as certainly definite limitations. Their use, implicitly perhaps more often than explicitly, has led almost to the assumption that as regards dietary habits all men are alike both in their tastes and consumption. Further, the assumption is made that the data from which these average figures, and ultimately standards, are derived have been obtained from materials of constant composition. How many realise that the fundamental data have been derived from a relatively small series of analyses of food materials, collected most often from a limited area? We know, or we ought at least to know, that the amount of protein, minerals and vitamins present in vegetable foodstuffs varies with the season, type of fertiliser used, type of soil, and the like within quite wide limits.

Our so-called standard analyses of foodstuffs then have not the fixity of value which is commonly assumed. Our knowledge of the basic metabolic processes is equally defective. The most fundamental and probably most intensely studied phase of metabolic activity—basal metabolism—although so commonly used as a base level is literally founded on a series of assumptions. The very name basal metabolism, as Krogh pointed out, is not justified. It does not, and never can, represent a true basal condition. Moreover, it is rarely if ever carried out under rigid standard conditions. Although it does not seem to be commonly recognised, the basal values obtained vary with the nature of the food consumed before the test. If this is rich in protein the basal metabolism will be high, whereas if, for instance, carbohydrate predominates it will be low. These variations, under average conditions, may be of little moment to the clinician but they do exist. Further, our interpretation of this metabolism is based on many unchecked assumptions, some in part at least manifestly untrue.

As a general rule, with an average healthy subject, we find the respiratory quotient to lie between about 0·7 and 1·0. We assume that the oxygen utilised is used solely for oxidative processes and that the carbon dioxide exhaled results only from such reactions, which moreover have proceeded according to certain type reactions. Implicitly we deny that any other type of reaction, such as synthetic activity, in which both oxygen and carbon dioxide may participate, takes place. It is true we obtain frequently, if only temporarily, respiratory quotients above 1·0 and more rarely below 0·7. We assume that reactions giving rise to an R.Q. over unity represent a conversion of sugar to fat, and those below 0·7 are only too often regarded as evidence of bad technique or, if the low R.Q.s persist, as possible evidence of conversion of fatty acids to some carbohydrate compound. Yet it must be admitted that, despite all these assumptions, warranted and unwarranted, the results in practice do afford us much useful information regarding the energy needs of the organism. This happy practical result is probably due to the physicochemical phenomenon that the caloric equivalent of oxygen, no matter for what particular purpose it is utilised in the body, is remarkably constant, a fact which has been clearly shown by the work of Leagard.

PROTEIN METABOLISM

I have selected for special consideration two essential constituents of an adequate diet, protein and calcium. As regards the breakdown of protein we assume that the nitrogen output affords a perfectly reliable guide to the degree and extent of katabolism within the tissue cells. The possibility, indeed the probability if not the certainty, of synthetic activity, where some of the partially or wholly katabolised protein is utilised for rebuilding is ignored. Further, we are apt to think of the metabolism of protein taking place by itself, when there is abundance of evidence that this metabolism can be markedly influenced by the presence of carbohydrate or fat. When a subject on a mixed diet, and in a state of nitrogen equilibrium, has the diet changed to one consisting of carbohydrate only there follows a steady reduction in the output of nitrogen in the urine, and when fat is substituted for the carbohydrate a steady rise in the nitrogen output results. I believe that more than a simple saving of protein breakdown, in the carbohydrate phase of the experiment, is involved. This view is supported by the recent work of Cuthbertson and Munro, who showed that if an ordinary mixed diet eaten in four meals, which sufficed to keep the experimental subject in nitrogen equilibrium, is so divided that two of the meals consist essentially of protein and fat and the other two of carbohydrate and fat and if these two types of meal are eaten alternately, instead of the previously found nitrogen equilibrium there results, by this simple adjustment of separating the protein from the carbohydrate moiety, a definite loss of nitrogen.

Experiments on the starving subject seem to suggest, however, that fat can and does act as a sparer of protein in the absence of carbohydrate. Lusk indeed categorically states that in starvation when there is no fat protein may burn exclusively. Hence it follows that "the quantity of the protein metabolism in starvation depends on the amount of fat in the body." Are we dealing with another type of metabolism here or is it evidence that there is a sufficient conversion of fat to carbohydrate to stay the protein loss? This possibility is denied by Lusk who regards such conversion as simply "a figment of the imagination." The metabolism of complete starvation does indeed seem to differ from that which takes place during feeding and even in under-feeding. It is generally accepted, as the result of many experiments and more particularly from work carried out in Krogh's laboratory, that carbohydrate is the fuel of choice in the performance of muscular work, and yet Lusk was convinced that under conditions of starvation, when the body has to rely on its tissues stores, the energy of muscular contraction is afforded by the oxidation of fat.

As already remarked, the assumption is generally made that the nitrogen excretion reflects exactly the protein metabolism in the tissues. This may be regarded as approximately true if the experiment is of long enough duration. But that it cannot apply to the daily turnover is shown by the fact that if on a single day, when a subject is in nitrogen equilibrium, an extra ration of protein is superimposed the resultant increased output of nitrogen is spread over a period of three, four or more days, whereas if a waste product like urea is superimposed in place of

protein the excess nitrogen is excreted within a day. Perhaps, to be more accurate, one might say that the nitrogen ingested in the form of protein does not wholly reappear in equivalent amount until after the expiry of the times stated, even if we assume that the nitrogen which does appear is the actual nitrogen ingested. Nor does the mystery of protein metabolism end here. In our consideration of the metabolism of the protein moiety we are inclined to devote all our attention to the excretion of nitrogen. It is true that protein is our only source of nitrogen, but protein is also our principal source of sulphur, an element as indispensable to the organism as nitrogen. Numerous experiments have shown that sulphur and nitrogen are excreted at different rates, after their ingestion in the form of protein, and that very special changes occur during the course of metabolism which would be extremely difficult, if not impossible, to explain on any simple combustion theory. When anabolic activity predominates in the tissues the sulphur is more quickly taken up than the nitrogen, and when katabolism holds the field sulphur is more rapidly excreted than the nitrogen. Why this selective utilisation and rejection?

FIRST-CLASS PROTEIN

If we turn to another phase of the protein problem rather popular at the moment—its biological value—we find this appealing concept has lost its original beautiful and apparently logical simplicity. Many of the modern workers regard this conception of the varying quality of protein as arising from the excellent experiments of Thomas, carried out about thirty years ago. As a matter of fact, the whole basis of the theory of variable biological value was outlined by Cullen in the last quarter of the eighteenth century. He then wrote in his Treatise of the Materia Medica: "The most part of the matter taken from animals are so nearly of the same qualities with the matter of the human body that there is little difficulty in supposing that the animal matter taken into the human body, as aliments, are perfectly well suited to this purpose, and requiring only the means of solution and mixture, with very little change of their qualities"; and he added: "it is true, indeed, that in many of the animal substances we take in the likeness of qualities to those of the human body is not always exact and complete."

Today it is laid down by the majority of those interested in dieteties as a sine qua non that the perfect or optimum diet should contain a certain proportion of its protein in "first-class" or "high biological" form. There are however able investigators, like Terroine, who deny the necessity of including first-class protein in the diet, but who at the same time admit that if the protein intake is at a low level and of poor origin supplementing it with a certain amount of first-class protein (protein derived from meat, viscera, milk and the like) may be useful. Generally the assumption is made that the biological value of a protein is something static, whereas it has been clearly shown that the biological value varies inversely with the concentration of protein in the diet. Thus Hamilton, in Mitchell's laboratory, has demonstrated that when whole egg protein constitutes 4 per cent. of the diet its biological value is 100; at a level of 8 per cent. its value is 91; at 12 per cent. it is 84; at 16 per cent. 62; at 20 per cent. 53; at 40 per cent. 42; and at 54 per cent. its value has fallen to 20. All values above 16 per cent. must, however, for technical reasons, be accepted with reserve.

The fact that the biological value of a first-class protein like egg protein steadily decreases as the proportion of protein in the diet increases is of itself most interesting, but a further observation of Hamilton adds still more interest. His experiments on rats show that as the proportion of egg protein increased from 4 to 16 per cent. in the diet of growing animals the growth-promoting value of the diet also increased. Diets containing from 16 to 30 per cent. were equal as growth promoters but when the protein content was increased above 30 per cent. the growth promotion decreased. Slonaker, in an earlier series of experiments with a mixed type of protein (both animal and vegetable) also found that maximal growth of rats took place when the diet contained between 14 and 18 per cent. of protein. Protein fed in excess of this optimum brought about retardation in growth. It is interesting to note that in this optimal range of protein in Slonaker's diets the calories from protein formed from 12 to 15 per cent. of the total calories. Taking Hamilton's 16 per cent. protein as the optimal protein concentration it is found that protein calories formed 13·5 per cent. of the total calories ingested. In this connexion it may be recalled that the proportion of protein calories ingested in the diet of the average man lies between 10 and 14 per cent.

There is another important aspect of this interesting problem of biological values which is related to the amino-acid make-up of the proteins. Biological values are not of necessity cumulative. Thus two proteins which are deficient in the same amino-acid, let us say lysine, will not supplement one another in a diet, but on the other hand if two proteins differing from one another in their amino-acid deficiencies are combined in a diet they probably will supplement one another, sometimes to a marked degree, as when meat proteins are combined with flour proteins. Thus, it has been shown by Mitchell that when beef proteins with a biological value of 66 are combined with flour proteins with a value of 55 in the proportion of 1 to 2 the combination possesses a biological value of 73, a value higher than that of the beef proteins by themselves. In this supplementary action lies the value of a good mixed diet in everyday life. Thus the addition of proteins derived from animal sources, like meat and milk, will increase the food value of a diet mainly made up of cereals.

SPECIFIC DYNAMIC ACTION OF PROTEIN

It is not only the special combinations of foodstuffs which are involved in the question of the adequacy of diets. Rubner was the first to call attention to the fact that when the proximal principles, protein, fat and carbohydrate, and in particular protein, were fed to animals they gave rise to a very definite production of heat—specific dynamic action he called it. There is absolutely no doubt about the increase in heat production but so far the various explanations which have been offered for this phenomenon have not been generally accepted. It seems however to be certain that, whatever the reaction involved, its energy cannot be utilised for the performance of muscular work, although the extra heat may play a useful part in warming the body. As Lusk put it: "the energy of mechanical work is superimposed upon the quantum of energy evolved from the specific dynamic action of protein. The two factors are completely separable entities."

In recent years the question of the specific dynamic action of proteins has again aroused attention, sometimes under the title of thermogenic action. It has, I think, been conclusively shown that, just as is the case with the biological value, the thermogenic action of foodstuffs is not the same at all levels of feeding.

It has also been suggested by Hamilton that the specific dynamic action of food depends upon the purposes for which the food is utilised in the animal body. Again to quote Lusk: "We may conclude . . . that, if a mixed diet be so constituted as to conform to the exact needs of the tissues and be slowly introduced by absorption from the intestine, the specific dynamic action is virtually negligible, and that when there is great undernutrition the gradual digestion, absorption and deposition of fat, added in excess of the body's requirement of energy, may be accompanied by little or no manifestation of specific dynamic action." In other words, the more perfectly balanced the diet, for any particular organism, the greater will be the efficiency with which it is utilised, the smaller will be its specific dynamic action and the greater will be its net energy value. Incidentally, it may be remarked, Hamilton also found that the specific dynamic action of the diet decreases pari passu with each increase in the percentage of protein in the diet, up to the level of about 18 per cent., it then remains constant between 18 and 30 per cent., and thereafter it increases in diets which contain 42 per cent. and over of protein.

TRANSPORT OF WOUNDED

SURGICAL ASPECTS*

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Hodgen's suspension splint for fracture of the femur was specially designed during the American civil war for the treatment of compound gunshot fractures of the femur. The frame was slung to the tilt of the covered wagon in which the men were moved. This was, I believe, the first example of the transport of wounded being considered as a surgical problem. Our wars in the Sudan and in South Africa at the turn of the century were in areas too vast for the transport of wounded to be a surgical as distinct from an administrative problem. Between 1900 and 1914 surgery had so developed that operation dominated the subject. The surgeon had not merely to apply splints and dressings but also to operate on more of the wounded; his operations became more extensive and had to be done as early as possible. It became necessary both to bring the surgeon and his nurse to the wounded man and to bring the wounded man more quickly to the surgeon. But the surgeon is still powerless if the patient is not in a fit state to undergo the operation; and so arose two surgical subjects ancillary to the work of the operator: resuscitation of the shocked and collapsed, and surgical transport of wounded, which includes everything, other than the first-aid dressing, that is done to diminish the effects of wounds and of exposure, before the patient arrives in the hands of the surgeon, so that a minimum of resuscitation is needed.

Time is an increasingly important factor in the transport of the wounded. All arrangements for the loading and unloading of vehicles and for their entries and their exits; all communication between units, giving warning of the arrival of wounded, with a note of their numbers, their severity, and of any need of special immediate attention; direction of traffic on roads, preference being given to certain types of vehicle, and the speed at which they are allowed to move, all come under this head. But there is something more than time; it includes everything else that can be done to bring the wounded in a fitter state to the surgeon.

The surgical aspect of the transport of wounded must deal mostly with those seriously wounded, but it is not enough merely to consider only their carriage to the place where they are operated on; we must also consider their transport after operation. This entails consideration of whether they can be moved at all, and whether with certain wounds the patient can travel better before operation than after.

THREE-BLANKET METHOD

Some unknown person devised a method whereby the body could, with three blankets, be protected from the cold from all directions. Two layers at least cover the patient above, below, and on either side. This simple method has saved lives, as in the following case (Layton 1917):—

The nights are pretty "parky" in Macedonia, and it was at midnight at the end of May that a gunner was brought into the main dressing-station at Kalinova. He was very shocked, but had he not been wrapped up by the three-blanket method he would have been more so and might not have stood the journey in the litter over the hills. We put him on the trestles in our dressing-room, a mud-walled hut roofed with a tarpaulin, and under him we put two oil lamps while we got things ready. His breast had been blown away, the skin of his forearm was widely torn from the muscles underneath, and an ugly cut across his chin had divided his lip. He was better by 3.30 A.M. and fit to stand an anæsthetic. No big vessel was divided, but he had lost much blood by oozing from his pectoral muscles.

Dawn was just coming as we had done, when a tiny bit of shrapnel was found sticking in the skin by the patella. So we waited an hour or two and then were at him again, excising the wound under local anæsthesia. The shrapnel had penetrated the synovial membrane, and we sewed up a tiny hole in this. Then we put him in a splint, raised him on a back rest tied to the stretcher, and "cooked" him again. We got him down on a mule litter the 10 miles to the casualty clearing station (C.C.S.) at Karasuli that evening when the heat of the sun had passed. That man recovered.

FRACTURED FEMUR

Meurice Sinclair's adaptation of the Thomas knee-splint to the fracture of the femur is, in my opinion, the greatest single piece of surgery of the great war. Before it fractures of the femur were the most fatal of all wounds; after it the man had a good chance.

A means was devised, by my stretcher-bearers, of putting on the Thomas splint as a temporary measure with the man's puttees. One of these was wound on to the splint and fixed with pins, and the other, in a clove hitch, was put over the ankle without removing the boot and gave the extension. The tapes were cut off and used for tying the splint to the cross-bar that goes with the stretcher. Thus, when the splint tied to a cross-bar was taken into action by a stretcher squad, it could be put on the wounded man, where he fell, with no more equipment than the scissors and the packet of safety-pins that are carried in the surgical haversacks. The new short puttee may make this method impossible.

How great could be the pain and therefore the shock of a fractured femur was exemplified by a case that occurred in that wild jumble of hills to the south-east of Jerusalem known as the Wilderness of Judæa.

* Based on notes of a Hunterian lecture given at the Royal College of Surgeons in April, 1919.

On a reconnaissance one person was hit. A bullet had entered the inner side of his thigh and was sticking nearly through the skin of the back of the limb, from which place it was removed by a medical officer using the scissors from the haversack as a pair of bullet forceps. He examined carefully and could find no evidence of a fracture; nor did the direction indicated by the wounds suggest one. The patient was bandaged, put on a stretcher, and sent off to Jerusalem. He groaned every time the stretcher was lowered, or when a bearer kicked a stone; but this was put down to the fact that he was being carried by untrained infantry men and not by expert bearers of the ambulance. A desert sand-cart was sent for, and he was put in this but immediately cried aloud at every jolt. He was not a man to do so unnecessarily, and after a few hundred yards he had to be removed from the cart and carried by hand ten thousand yards to where he could be put in a motor ambulance and brought to the dressing-station.

He was much collapsed, and the skin of his thigh was enormously distended, indicating a severe internal hæmorrhage While the patient was under the anæsthetic, from which he nearly died, Colonel Henry Wade could still find no evidence of a fracture, but when he had made the incision he found a long spiral break without displacement. The bullet had hit the bone at a tangent, divided a perforating artery, turned over, and ploughed up the muscles at the back. Thus were explained the intense pain on any movement, the absence of crepitation, and the severe shock that intensified the collapse from the loss of blood. The patient owed his life to the fact that he was the only casualty, and that a whole platoon of infantry could be detailed to his carriage over the long distance in the hills. He does his work to-day largely on horseback as agent to a great estate.

HEAD INJURIES

From the fracture of the femur, for which so much was done, we may turn to the head injury, for which nothing was done. We just wrapped the patients in their blankets, dumped them on a stretcher, and sent them off. Nor have I since been able to think of anything in the collecting zone; the problem of the pain in a head injury from a jolty movement remains to be solved by someone in this war. The bearer knows more about this type of patient than do the medical officers, because he is with him on the journey. This exemplifies the difficulty of the study of transport as a surgical subject. There is a triad of responsibility: the surgeon who advises the removal; the doctor who receives the patient; and the administrator, not necessarily a medical man, who is in charge of the vehicles of transport. The surgeon who advises removal cannot learn how his patient has stood the journey; the doctor who receives the patient does not know the condition in which the patient started, and he is inclined to think that the surgeon who advised removal is poor in judgment. The transport of head injuries, however, involves more than modifications of vehicles to allay the effects of jolting. Of the great changes in the last twenty years the development of cranial surgery is one of the most striking. It has passed from the hands of the general surgeon into those of the cranial specialist. How soon must operation be done? and does the patient stand movement better before or after operation? The principle on which we were working in 1918 was that, except the case needing decompression, the head injury was not so immediately urgent as the abdominal wound; but we believed that, although a man with a head injury stood transport fairly well before operation, he stood movement after the operation very badly. In the second trans-Jordan raid we had in the Jordan valley two operating units which dealt with all the abdominal and thoracic injuries; but we continued to send the men with head injuries another 22 miles, with a climb of nearly 3000 ft. up to the C.C.S. at Jerusalem, at which more permanent unit they could be kept longer. The recent experience of Trueta (1939) seems to confirm this, except that it may be necessary at once to excise the damaged scalp.

The problem before us is not to bring the surgeon to the patient but to bring the patient to the specialist surgeon. This can only be done by taking the specialist further away, so that he is equidistant from all parts of a line, and then transporting the patient with an increased velocity—i.e., by aeroplane. Once the patient is in it he is free from jolts except in taking off and landing; and these could be neutralised by shock-absorbing springs on the stretcher rest. An addition of a few hundred miles would not then matter. It does not seem impossible to concentrate all head injuries in one hospital, staffed by expert neurological teams, away from great cities, and in the country where the ground would supply an area for a landing-place adjoining the hospital. The patient could then be wheeled straight from the ambulance plane into the admission room and then, if need be, into the theatre. In the main dressing-station of a field ambulance it would be possible for an orderly to shave the head, and for any medical officer to excise the damaged tissues of the scalp round the wound without going deeper. He could then sow the area with maggots or apply a dressing such as that recently described by Weatherbe (1939). The patient would then be ready for transport by ambulance plane to the surgical cranial unit.

ABDOMINAL INJURIES

It was especially the surgeons of St. Thomas's Hospital who at the turn of the century were laying emphasis on the time-factor in the treatment of civilian internal abdominal injuries (Croft and Battle 1894). The same applies to the open abdominal injury of war; but, as Taylor (1939) has pointed out, in the last war the abdominal surgeon could do nothing until the methods of resuscitation of the shocked had developed. The less resuscitation is needed, the greater the patient's chance. Therefore transport consists of two things: time and rest.

Time.—Trueta (1939) has said that you must think in terms of time and not of distance. This is true, but a diminished distance means a diminished time; therefore every medical unit, vehicle, and individual must be pushed up to or beyond the limit of safety. The argument of the administrator who says that medical personnel must not be endangered, because it is such a waste if any is hit, is sound. In an engagement all are so hard at work that the loss of any is serious, and the loss of each is doubled because he has to be transported and treated by the reduced number. But there are two fallacies in this argument: (1) although you need reasonable protection for the medical personnel to keep them so far back that they are never endangered is to put them where they cannot be of use; and (2) although the cautious administrator thinks mainly in terms of engagements, we surgeons have to think in terms of interim periods besides engagements. We know that in engagements the efficiency of our work will be impaired by excess of work; but in siege warfare there are many casualties in the long "peace-times" that interpolate themselves between occasional "strafes." Surgical arrangements have to be made for the two sets of conditions, and the more highly polished they are for the "peace-time" conditions, the better they will work in a "strafe." This is particularly so because in an engagement the placing of new medical units depends more on strategical and tactical grounds than

the ordinary doctor realises. While we have to bow to the staff on this point, it is also our business to inform them of any new advance that has arisen since a former war. Not only do they wish it, they demand it and once having grasped it they expect it to be carried out. Today the race against the microbe must be considered in the placing of every medical unit.

When the situations of the medical units have been fixed, much can be done in each area to expedite transport of special cases, abdominal wounds being the most urgent. Perhaps the most important factor is intercommunication. In 1916 the ambulance had no signalling equipment except three pairs of semaphore flags. It was only by a "wangle" that advanced dressing-stations could be linked to advanced brigade headquarters. When this was done in a certain part of the western front, the minimal period for an abdominal case to reach the C.C.S. was cut down from six to four hours (Layton 1917). The word "GUTS" makes an excellent code; it is dynamic, makes the hearer sit up ready for action, and is short to transmit by Morse and almost impossible to mistake on a telephone. An orderly had but to run into the battalion signalling-office and shout this word for it to be transmitted to the advanced and main dressing-stations and to the C.C.S. An ambulance was sent up forthwith, the medical officer was awaiting the case at the advanced dressing-station, and, missing the main dressing-station, the patient was sent direct to the C.C.S., where again the surgeon was ready awaiting him. It was not only the minimal time that was cut down, it was also the average time. In a "strafe" it may be impossible to give priority to medical messages; but in "peace-time" certain of these should have it.

Trueta's time-factor is not gained by the rate at which any vehicle passes over any given piece of road but by the minimum of delay at every point between that where the wounded man is hit and the resuscitation-room adjoining the operating-theatre. It is the jolting that harms during the period of transport; and jolting increases with increased speed and, above all, from sudden deceleration. Even on the perfect roads around London a damaged person sustains shock from movement; in the shell-scarred roads of a war area this is increased, and I doubt if any car should ever exceed 30 miles an hour when carrying a seriously wounded person.

Time is saved more by the careful organisation of every medical unit than by any other means, especially the arrangement of its exits and its entrances. Here again Trueta bears out what was learnt by past experience. In any area or before any engagement the main lines of this part of the surgical aspect of the transport of wounded must be laid down by the staff on the advice of senior medical authorities; but there is no-one in the corps down to the newly joined officer, the nursing orderly, or the stretcher bearer who cannot do something in his own small way to avoid delay as the wounded man is going through and thus help to save a life here and there. The race against the microbe demands that the dead and damaged tissue of every wound should be excised before those organisms have had time to develop. It would be well if we surgeons could lay down a definite time after which treatment is of no avail. This would give the administrator something definite at which to aim. It would also change the balance of responsibility. This would no longer limit the administrator to doing what seemed possible but would compel him to show cause whenever a patient did not reach the surgeon within that time. Surgery should no longer be subservient to tactics but a part of it.

Rest.—In the treatment of abdominal wounds the most important single point is that the patient should be put in the Fowler position at the first possible moment and kept there throughout the treatment. With a simple modification of the army stretcher it was possible to transport a patient in this position in any vehicle; and it is seriously impairing his chances of recovery not to do so. This position is so important that in my opinion the operating table should, if possible, be tilted to this angle, when the patient is put on it, and kept so during the whole operation, and that the patient should then be put back into the carrying-chair on the way to his bed; so that throughout the whole period the pelvis is kept dependent. Not being an abdominal surgeon, I cannot say whether this is technically possible.

Lack of absorption of poisons does not explain the sole advantage of the upright position. Improved ventilation of the lower part of the lungs is another. Mere comfort is the third, perhaps the most important. Captain Milton noticed an immediate improvement in the condition of a patient as soon as he was put into a Radmore chair (Layton 1917).

This, named after its designer, Sergt. E. S. Radmore, R.A.M.C. (T.), was worked out in Thessaly in 1916, being first tried on a travois. To travel thus was alarming even to the fit; so it was transferred to a mule litter. Since an angle of 45° with the horizontal is all the raising of the body that is needed, it was possible to build it on an army stretcher from which the canvas had been removed. This could be put on any form of transport then built to take a stretcher, and so it was used on mule litter, cavalry ambulance, desert sand-cart, and motor ambulance. It consists of four inclined planes, each at right angles to one another, and each at an angle of 45° with the vertical and horizontal. The first plane, the longest, is for the head and body, the hip-joints coming at the angle. The next two are equal for thighs and legs, with the knees at an apical angle. Then come a second lower angle and a short inclined plane for the feet. The three-blanket method of wrapping up a patient is as applicable to it as to a straight stretcher.

The greatest testimonial to this mode of carriage was that the bearers used to take the Radmore chair out of the ambulance and carry it sometimes for miles to the wounded man. The original idea had been that it should be sent forward in the vehicles as far as they went and the patient put in it there; but the bearers got to know how much easier it was for the patient if he were carried upright, and they were prepared to carry the extra weight there and back, with an increased awkwardness of carriage, to give the man an easier passage on his way. I believe that every person carried thus was given as greatly an improved chance of life over the man carried supine as was the patient with a fracture of the femur transported by Meurice Sinclair's method over the man put up in Liston's long splint. Similar chairs or modified stretchers were made in other ambulances and units in other parts with similar success (Hughes and Banks 1918). It is, however, essential that the man, once he has been sat up, must not be laid down again; therefore such apparatus must be standardised and interchangeable, or its value disappears when the patient moves from one medical unit to another, and personnel must be educated not to lay a patient down who arrives at their unit in a sitting posture.

Transport by aeroplane.—In mobile warfare the only chance of saving patients with abdominal wounds is by

the collection of wounded by aeroplane. Collection of wounded by aeroplane in mobile warfare would be the easiest thing in the world except in retirement or defeat. In siege, or trench, warfare with the present development of flying it should be possible to take the surgeon and his nurse to the limit of safety, which one could define as the furthest point to which the enemy's heavy artillery could reach. Thus the time-factor to the point where the operation could be performed would be shortened; but the necessity for keeping patients there would result in congestion. If by the ambulance plane they could be moved earlier than by car, this congestion would be obviated. I believe this is so, and that in the plane the patients can be moved earlier than by any other means of transport. They could then be moved further, indefinitely far behind the line, for there is then no race against time to get the patients to the operating-theatre. They could be brought to the quiet country-side where the plane can land near the hospital and the patient be taken straight into the ward and so to bed.

Whatever be the vehicle by which the patient is moved from the unit where he has had his operation, he must still be moved in the upright position; therefore the transport for the transfer of these patients from the unit of first instance to the station of immobility, whether it be an aeroplane, a motor ambulance, a horse vehicle, or a mule litter, must be able to take a Radmore chair or similar modification of the ordinary stretcher. To lay them flat on this again is to bring back Death after he has been driven away.

WOUNDS OF LUNG

Lung cases come between the abdominal and head injuries, and we may briefly apply to them the considerations already put forward. Transport in the upright position is essential; but, whereas in the abdominal wound this is an ancillary treatment, like resuscitation, to the work of the operating unit, with the lung wound it is the treatment itself; for, except for the open sucking wound, it is probable that those cases have a better chance without immediate operation. The race against time therefore is less strenuous than with the abdominal wound. It is not the prevention of infection by the microbe of the intestinal contents but the need to get the man into a unit where he can be kept and nursed. If the nursing can start before he gets there, so much the better. This in effect is what the erect position means to the man hit in the lung. With modern transport it should be possible to do more for the nursing of the patient on a journey than is entailed in the three-blanket wrap-up and the erect position. If a couple of stewards can serve luncheon on a cross-channel plane, a couple of nurses can apply resuscitation in the same circumstances; and the lung case is specially suitable for this. Once in a plane, with an intravenous drip set up and some method of using the heat of the engine to "cook" the patient, it does not make much difference how far he is transported, so long as the plane lands within the hospital grounds, whence the patient can be carried by the awaiting personnel direct into an admission ward without the pulling about of an intermediate form of transport.

CONCLUSIONS

Besides being divided into time and rest, the surgical aspect of the transport of wounded may be divided into that which comes as a result of organisation and administration by the higher authorities, and that which comes from the skill, care, and attention of every officer, non-commissioned officer, and man of the R.A.M.C., and the latter is as important as the first.

The four types of wound—femurs, bellies, heads, and lungs—that have been taken as examples were sufficiently common in my experience to justify my writing about them. There are, no doubt, others, such as injuries to the spine or wounds that shatter the pectoral girdle without involving the chest, to which similar studies may be applied; and the initial preparations for all these should be made before they happen. This is a part of training. In civil surgery training without the presence of a patient does not come into our scheme of medical education. In war surgery training is important not only for the personnel but also for the officers of the R.A.M.C., and it is as important for them as for the officers and personnel of the fighting troops, who start to train in every lull in hostilities. Medical units are fully employed when the lull begins and are never entirely freed from the active prosecution of their special duties as are the fighting troops in a rest area; but at these times they are not fully employed, and it is possible for a proportion of their number, say a half or a third, to be detailed for training. Much of this is connected with the surgical aspect of the transport of wounded; it includes the application of splints to a degree which is much more than first-aid; and, when this has been practised by the officers, it can be taught to the personnel with the result, as we have seen, that they themselves may advance the doctors' special subject. Next there are the exits and entrances, including the loading and unloading of transport vehicles. In every unit every officer and man should know the way in and the way out and where the vehicles should be drawn up to assure the maximal efficiency for the conveyance of the patients from them to the admission room and thence to the theatre or the ward. Thirdly, there is stretcher drill. This needs as constant practice as does the musketry of an infantry battalion. It seems to be a common idea that stretcher bearing is a thing that comes by nature. It needs as high a coördination of the muscles as does the hitting of a golf ball, but more than is needed for the swing of a single body. It is the coördination of two, three, or four bodies, and it can never be guaranteed that the same two, three, or four will always be working together. Constant training in these three things does much to diminish the shock and to shorten the time of transport for every wounded man who goes through their hands. During the last war there was much talk of medical officers hanging about with nothing to do. This should not be. They can always be training themselves and the personnel. However specialised each doctor may be, he has a certain amount that he must do that is common to every member of the corps; and of that the elements of the surgical aspect of the transport of the wounded form a part.

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"... The psychopaths are always with us. But in times of coolness we hold consultations about them and in times of heat and passion ... they rule us."—ERNST KRETSCHMER, 1929. (Quoted in the *Times*, March 15, 1940.)

TUMORIGENIC POWERS OF STILBŒSTROL AND FOLLICULAR HORMONES

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It has been shown by our previous work (Lipschütz and Vargas 1940) that stilbœstrol will provoke uterine and extra-uterine fibroids in the guineapig when 100 μg. or more is injected subcutaneously thrice weekly for about three months. With 1000 μg. considerable tumorigenesis may develop as early as about fifty-three days from the start of treatment. In this respect stilbœstrol behaves like the natural follicular hormones, free or esterified (Lipschütz and Vargas 1939a). Massive doses of stilbœstrol produced in our experiments other toxic actions, such as are known to be produced by the follicular hormones : diminution of body growth, loss of hair, sometimes fibrinous purulent peritonitis in the region of the uterus, and loss of blood from the genital tract. These experiments also showed that the tumorigenic action of stilbœstrol, judged by its capacity to provoke uterine and extra-uterine fibroids, was greater than that of œstradiol. This fact by itself, however, does not mean that there is a greater danger of tumorigenesis with stilbœstrol than with œstradiol. The danger depends on the relation between the tumorigenic dose and the useful hysterotrophic dose. The useful hysterotrophic dose is the quantity which when injected thrice weekly during three months will maintain the uterus of the castrated female guineapig at a normal level of about 1·0–1·5 g. (Lipschütz, Rodríguez, and Vargas 1939). In the present paper we give more detailed results of experiments on the tumorigenic and hysterotrophic doses of stilbœstrol.

TABLE I—TUMORIGENESIS DUE TO STILBŒSTROL

No. of animals	Body-weight (g.)	Dose of stilbœstrol per injection (μg.)	Length of treatment (days)	Average weight of uterus (g.)	Animals with macroscopic fibrous reaction		Total tumoral mark *	Animals with individual tumours marked not less than 1
					Uterine	Extra-uterine		
5	440–605	0·1	102	0·7 (0·5–1·2)	0	0	0	0
5	405–620	1·0	115	1·5 (1·5–1·6)	0	0	0	0
5	390–670	3·0	102	1·8 (1·4–2·7)	1	2	±	0
5	440–525	5·0	111	1·8 (1·5–2·3)	2	1	±	1
5	490–530	10·0	101	3·4 (2·6–5·2)	3	0	±	0
5	480–580	40·0	87–113	3·6 (2·0–6·8)	2	3	1·3	2
3	480–570	80·0	91	7·0 (3·9–9·0)	3	2	5·7	3

* Lipschütz and Vargas 1939c.

TUMORIGENIC POWER OF STILBŒSTROL

To 33 castrated female guineapigs 0·1–80 μg. of stilbœstrol in 0·4 c.cm. of olive oil was injected subcutaneously thrice weekly for eighty-seven to a hundred and fifteen days. The results are summarised in table I, which shows that the first manifestations of a uterine or an extra-uterine fibrous reaction already appear with 3–10 μg. of stilbœstrol per injection. These manifestations are of different kinds. Sometimes there are pronounced fibrous scars on the uterine apex, around the kidney, or in the hilum of the spleen. In other cases very small fibroids just visible to the naked eye are found on the uterine horns or at the junction of the uterine horn and the mesometrium. Indeed one must be careful not to confound these small and insignificant fibroids with the small muscular excrescences which in most normal adult guineapigs are found on the ventral surface of the uterine horn ; the normal excrescences are always disposed in a regular chain, whereas the small white fibroids only sometimes show this arrangement. The muscular excrescences can be distinguished from the white fibroids by their smaller size and their brownish colour. But we must insist that both might be overlooked by the naked eye when no special attention is drawn to them. With 40 μg. and especially with 80 μg. per injection the tumoral reaction becomes considerable (see also fig. 3).

COMPARISON WITH ŒSTRADIOL AND ŒSTRONE

One may question the importance to be attributed to the findings with 3–10 μg. of stilbœstrol (± in table I) ; but it is remarkable that in 37 experiments, in which 5–80 μg. of œstradiol or of œstrone was given thrice weekly during three months, a similar, even insignificant, fibrous reaction did not develop (Rodríguez 1940); 100–200 μg. of œstradiol per injection is necessary to provoke a reaction similar to that produced with 3–10 μg. of stilbœstrol, and not less than 400 μg. of œstradiol or of œstrone (Lipschütz, Rodríguez, and Vargas 1939) to obtain a reaction similar to that produced with 80 μg. of stilbœstrol. The value of these quantitative results is limited, because of the great individual variations in fibrous tumorigenesis ; but they clearly corroborate our statement that the tumorigenic action of stilbœstrol, as judged by the development of uterine and extra-uterine fibroids, is much greater than that of œstradiol administered in equal quantities.

COMPARISON WITH ESTERS OF ŒSTRADIOL

The tumorigenic action of œstradiol is greatly enhanced by esterification (Lipschütz and Vargas 1939b), that of 5–40 μg. of œstradiol given as monobenzoate being greater than that of similar quantities of stilbœstrol (Bellolio 1939), though, as already insisted, the individual variations are very considerable. When 10 μg. of œstradiol is given as the monocaprylic ester, enormous fibroids develop (Jedlicky, Lipschütz, and Vargas 1939, Chaume 1940). But it is very remarkable that with 80 μg. of stilbœstrol tumorigenesis is no less than with the same quantity of œstradiol given as monobenzoate (figs. 1 and 2). A comparative diagram of tumorigenesis with stilbœstrol, the free hormones, and two esters of œstradiol (monobenzoate and dipropionate) is given in fig. 3.

HYSTEROTROPHIC DOSE OF STILBŒSTROL

With stilbœstrol 0·1 μg. per injection (table I) the uterus of a castrated guineapig has an average weight of 0·7 g.—i.e., the weight which corresponds to that of a castrated guineapig receiving olive oil without œstrogen (see fig. 1 in Lipschütz, Vargas and Ruz 1939). The hysterotrophic dose of stilbœstrol is certainly greater than 0·1 μg. but probably less than 1 μg. In accordance with this no influence on the teats was noticed with 0·1 μg., and there was only exceptionally a partial and transitory opening of the vagina after several injections of 0·1 μg. With 1 μg. the vagina

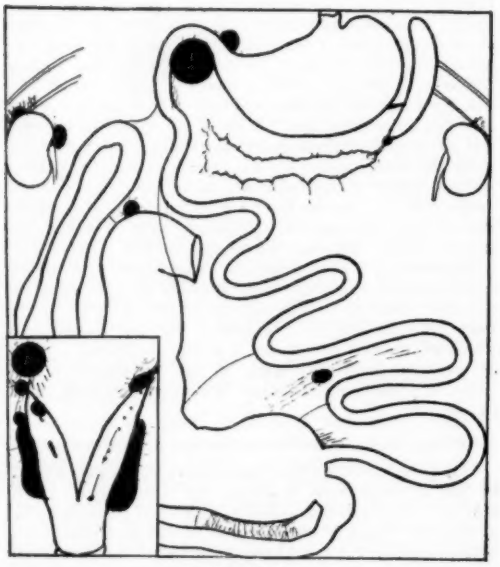

FIG. 1(*a*)

FIG. 1(*b*)

FIG. 1—(*a*) Diagram showing sites of uterine and extra-uterine tumours in a castrated female guineapig treated with subcutaneous injections of stilbœstrol 80 μg. thrice weekly for 91 days: parametric tumours mark 3; apical tumours, mark 3; tumours of mesentery and near kidney, mark 3; tumour at lower pole of spleen, mark 1. (*b*) Dorsal view of uterus of same guineapig; arrows indicate parametric and apical tumours. (Nine-tenths of natural size.)

opened definitely after the first injection, and there was a considerable development of the teats. With 1 μg. of œstradiol or of œstrone injected thrice weekly during three months the uterine weight was also maintained at a normal level. The work is still in progress, and as yet we cannot say whether with this quantity the limit is reached; but so far it seems that the hysterotrophic dose of stilbœstrol is smaller than that of the natural hormones, such as œstradiol and œstrone. On the other hand, the hysterotrophic dose of stilbœstrol is several times greater than that of the esterified œstradiol. All the four esters that we have so far examined—monobenzoate, monocaprylate, dipropionate, and 17-benzoate-3*n*-butyrate—maintained with 0·1 μg. of œstradiol per injection the uterine weight of the castrated guineapig at a level near to or greater than normal. This is very significant, because the tumorigenic dose of stilbœstrol at a certain quantitative level (80 μg.) equals that of the monobenzoic ester of œstradiol.

DISCUSSION

One must question why there is such an enormous difference between stilbœstrol, on the one hand, and the free natural follicular hormones, on the other, as regards their tumorigenic dose. The comparative increase in weight of the uterus with increasing doses of these substances suggests an explanation. As seen from table I, the weight of the uterus increases greatly with stilbœstrol when the dose is raised from 1 to 10 μg., whereas with the natural hormones the increase in weight of the uterus is not so great; even with 20 μg. of œstradiol the weight of the uterus is not far from normal (fig. 4). One must suppose that this is due to the capacity of the organism to inactivate œstradiol and œstrone by transformation into œstriol and by combination with glucuronic acid (Marrian 1937). Our experiments with the hysterotrophic and tumorigenic doses of natural hormones and stilbœstrol suggest that the organism cannot inactivate stilbœstrol with the same facility as it does the natural follicular hormones.

As already stated, the tumorigenic action of esterified œstradiol is greater than that of stilbœstrol when doses of 5–40 μg. per injection are compared; but, since the hysterotrophic dose of the esters is so small (about 0·1 μg.), there seems to be a wide range between the hysterotrophic and tumorigenic doses. Whether this range is equal for œstradiol, œstrone, their esters, and stilbœstrol we cannot yet say with certainty, but it seems that the range is greater with the free natural hormones, and smaller with the artificial œstrogens.

The uterine hæmorrhage produced in the guineapig by prolonged treatment with follicular hormones or with stilbœstrol seems to indicate that more harm is done to the uterus with stilbœstrol when compared with the natural follicular hormones, free or esterified.

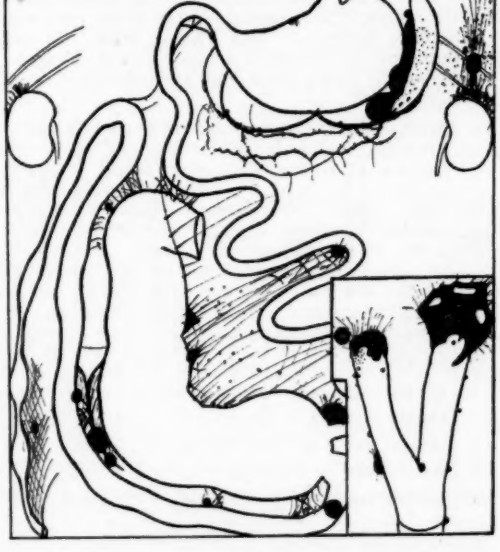

FIG. 2—Diagram showing sites of uterine and extra-uterine tumours in a castrated female guineapig treated with subcutaneous injections of œstradiol monobenzoate 80 μg. thrice weekly for 83 days: small subserous and parametric tumours, mark 1; big apical tumours surrounding left cystic tube, mark 3; mesenteric tumours, mark 3; tumour and tumoral seed above left kidney; big tumours between stomach and spleen, mark 3; tumoral seed on spleen and mesentery; fibrous tissue in various parts of the mesentery.

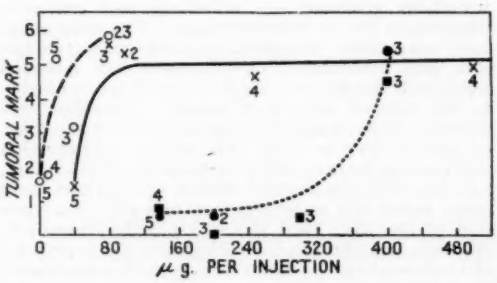

FIG. 3—Tumorigenic action of stilbœstrol, free follicular hormones, and œstradiol monobenzoate in 83 castrated female guineapigs treated with subcutaneous injections for about three months. Each point indicates the average tumoral mark, and the numerals on the curves show the number of animals in each group. Results obtained with stilbœstrol in doses less than 40 μg. have been omitted.

○ = œstradiol monobenzoate (5, 10, 20, 40, and 80 μg.); × = stilbœstrol; ● = free œstradiol; ■ = free œstrone.

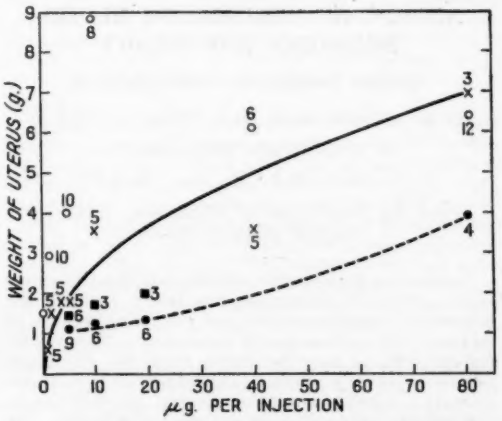

FIG. 4—Weights of uteri of 121 castrated female guineapigs treated with stilbœstrol, free follicular hormones, and œstradiol monobenzoate for about three months. Key as in fig. 3.

This bleeding, due to changes in the uterine submucosa, is much commoner with stilbœstrol than with œstradiol or with œstrone (table II). The frequency with which bleeding takes place in animals treated with stilbœstrol is no less than that due to the esters of œstradiol when equal doses are compared. This again is very significant, because the hysterotrophic dose of stilbœstrol is several times greater than that of all the four esters hitherto examined.

TABLE II—METROSTAXIS IN GUINEAPIGS TREATED WITH FOLLICULAR HORMONES OR WITH STILBŒSTROL

Dose per injection (μg.)	Number of animals (tr. = treated; bl. = bleeding)					
	Stilbœstrol		Œstradiol and œstrone*		Benzoate and dipropionate of œstradiol†	
	Tr.	Bl.	Tr.	Bl.	Tr.	Bl.
1–5	15	1	9	0	20	1
10–20	5	4	18	0	8	2
40–80	8	5	4	0	12	5
100–250	6	3	22	0	—	—
400–500	4	2	9	1	—	—

* Rodríguez (1940). † Bellolio (1939).

SUMMARY

Our former statement (Lipschütz and Vargas 1940) that stilbœstrol can provoke in the guineapig, when subjected to a prolonged treatment with subcutaneous injections of this substance, the same fibrous tumoral reaction as can the natural or esterified hormones is fully corroborated by new experiments.

This tumorigenic action of stilbœstrol is much greater than that of the natural hormones (œstradiol and œstrone) when equal quantities are compared.

The tumorigenic action of small doses of stilbœstrol is less than that of similar doses of esterified œstradiol; but with greater doses the tumorigenic action of stilbœstrol equals that of similar doses of certain esters of œstradiol (monobenzoate and dipropionate). This is all the more significant because the hysterotrophic dose of the esters of œstradiol is much smaller than that of stilbœstrol.

The guineapig uterus increases beyond the normal weight more rapidly with stilbœstrol than with the free natural hormones. This is tentatively explained by an inability of the organism to inactivate stilbœstrol so rapidly and effectively as œstradiol and œstriol.

Loss of blood from the genital tract in the guineapig treated with stilbœstrol is commoner than with the natural hormones but as common as with similar quantities of the esterified hormones. This is considered to be a sign of a greater toxicity of stilbœstrol as compared with the natural hormones.

Our thanks are due to Prof. E. C. Dodds for a generous supply of stilbœstrol.

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IN "Man Without Uniform" (Hutchinson and Co. 1940. Pp. 360. 9*s*. 6*d*.) Willy Corsari seems to point the moral that a doctor needs a sense of proportion. Remco de Raai, a mother-fixed and atheistic young man, grew up in the country and became a general practitioner in a Dutch town. But he became obsessed with the sufferings of his patients, and entered on a state of mental conflict over the ethics of euthanasia. Later he felt driven to undertake cancer research and this indirectly involved the death of one of his children and the break-up of his hitherto successful marriage. The trite atheistic arguments are presented ingenuously and the discussions on euthanasia are needlessly dramatic, but there is an attractive quietness and simplicity in the descriptions of the relationship between doctor and patient.

ACTION OF VERITOL ON BLOOD-PRESSURE AND HEART

UNDER VARIOUS ANÆSTHETICS

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VERITOL — β-(*p*-oxyphenyl)-isopropylmethylamine —an isomer of ephedrine, has lately aroused the interest of experimentalists and clinicians because of its remarkable effects on the circulation. The following conclusions may be drawn from the published reports on its main pharmacological actions in man and animals. Veritol raises the arterial blood-pressure, particularly in hypotension and surgical collapse. Its exact mode of action is not yet properly understood, but apparently veritol acts differently in some ways from adrenaline, especially in the duration of the increase in blood-pressure, which lasts approximately twenty times longer with veritol than with adrenaline. The height of the rise in blood-pressure seems to vary considerably and at times goes beyond what has been called "the physiological level."

The rise of blood-pressure was thought to be due to an effect on the blood depôts of spleen and liver and on the great veins. The long latent period between the administration of veritol and its maximal action on arterial pressure, the prolonged effect, and the gradual fall of blood-pressure to normal were explained as consequences of comparatively slow changes in the amount of blood circulating and in its distribution. Finally, there is some evidence that veritol has a toxic action on the heart in man. An annotation in THE LANCET (1938) drew the attention of clinicians in this country to the possible therapeutic value of veritol:—

> "Experience has shown that physicians on the Continent tend to be unduly optimistic about the value of new drugs; but, even when this possibility has been discounted, there remains enough evidence to make veritol worthy of trial in acute hypotension and shock, or wherever a rise of blood-pressure is thought desirable."

Since many of the clinical reports deal with the action of veritol under surgical conditions, we thought it useful to test its action on arterial pressure in cats under various types and depths of anæsthesia. Further, in view of the clinical findings on cardiac disturbances, we examined by electrocardiography the action of veritol on the heart. Such experiments have not hitherto been made on animals.

METHODS

After preliminary light anæsthesia with ether, cats weighing 2·5–5·0 kg. were given various anæsthetics. The depth of anæsthesia produced with inhalation anæsthetics was controlled by varying with a screw clamp the width of a side tube connecting the tracheal cannula of the cat with the bottle containing the anæsthetic. The anæsthesia was usually kept very light, just sufficient to prevent the animals from struggling. The changes in the corneal wink reflex were a satisfactory index of the depth of anæsthesia. When chloroform was the anæsthetic, the arterial blood-pressure was a sensitive gauge of the depth of anæsthesia, because a slight deepening of narcosis invariably produced an immediate and gradually progressive fall in blood-pressure. The anæsthetics used were ether, chloroform, cyclopropane, chloralose, and pentothal. Cyclopropane was administered with the McKesson apparatus; carbon dioxide in the expired air was absorbed. Chloralose was injected intravenously in doses of 0·07–0·09 g. per kg. of body-weight; a 2·5 per cent. solution of pentothal was injected intravenously in doses of 0·5–0·75 c.cm. per kg. of body-weight. Electrocardiograms were taken before and at various intervals after the injection of veritol. Lead II was exclusively recorded. We used amplifier electrocardiographs the sensitivity of which was kept constant throughout the experiment. Veritol was injected intravenously in doses of 0·1–3·0 mg., the first injection never exceeding 1·0 mg. All intrajugular injections were made in equal volumes of fluid.

ACTION ON ARTERIAL BLOOD-PRESSURE

Under ether, chloralose, or pentothal anæsthesia.—The outstanding feature of the effects of intravenous injections of veritol in cats is the unpredictable character of the response of the arterial pressure. Intravenous injection of 0·2 mg. of veritol into cats under light ether anæsthesia may produce an abrupt increase in blood-pressure resembling that produced by adrenaline. The arterial pressure may rise, for example, from 130 to 200 mm. Hg or more in twenty to thirty seconds and may return to its pre-injection level two minutes after the administration of the drug (fig. 1A). In another instance the same dose of veritol increased the arterial pressure from 110 to 210 mm. Hg in seventy seconds; blood-pressure was normal again four and a half minutes later. Much slighter reactions were seen in other cats under ether anæsthesia; for instance, intravenous injection of 0·2 mg. of veritol raised the blood-pressure in many cases only to a small extent—e.g., from 160 to 180 or from 110 to 130 mm. Hg. The results obtained in cats under pentothal or chloralose anæsthesia were identical with those reported for ether anæsthesia and need no separate description.

There was no direct relationship between the rise of blood-pressure and the dose of veritol. In many instances injection of 2·0 mg. of veritol had a much smaller effect than the administration of 0·1 mg. in another cat, and 2·0 mg. might raise the arterial pressure by no more than 10 mm. Hg.

There was no correlation between depth of anæsthesia and extent of rise of blood-pressure after intravenous injection of veritol. Often, the increase in arterial pressure was slight in animals under light anæsthesia, whereas considerable adrenaline-like responses of blood-pressure were observed in cats under deep ether, pentothal, or chloralose anæsthesia, and vice versa.

In published reports, as already mentioned, claims have been made that veritol raises the blood-pressure only to its physiological level in arterial hypotension. Therefore we studied the relationship between initial level of blood-pressure and the response to intravenous administration of veritol. In our experience the pressor response to veritol might be equally great when the initial blood-pressure was high as when it was low. It should be borne in mind that the maximal possible increase in blood-pressure is smaller when the initial level of pressure is high than when it is low. In typical experiments 0·4 mg. of veritol raised the arterial pressure from 160 to 220 mm. Hg and from 90 to 180 mm. Hg; in both instances the blood-pressure was increased far above the "physiological level" for the cat, and in the first experiment a pres-

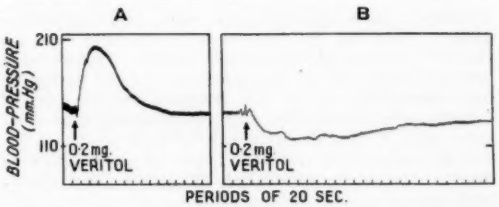

FIG. 1—Action of veritol under ether anæsthesia: (A) rise of blood-pressure and its return to normal; (B) fall of blood-pressure caused by a second injection of veritol 15 min. after the first.

sure already abnormally high was raised still further. Results similar to these were also obtained in cats given atropine in sufficient doses to paralyse peripheral parasympathetic nerve-endings.

Many observations were made on the effect on arterial blood-pressure of a repetition of the injection of veritol in various concentrations. The second injection was carried out at various intervals up to twenty minutes after the arterial pressure had returned to its pre-injection level. In no case did the second or subsequent injection of veritol in doses up to 10 mg. raise the blood-pressure by more than 10–15 mm. Hg, provided that a pressor response had been obtained with the first injection; usually the blood-pressure did not rise. Often, however, the second injection produced a fall of arterial pressure, variable in extent and duration, which amounted in some experiments to 50 mm. Hg (fig. 1B).

Under chloroform or cyclopropane anæsthesia.—The results obtained under chloroform or cyclopropane anæsthesia differ from those observed under ether, pentothal, or chloralose anæsthesia because of the absence of any definite pressor response to intravenous injection of veritol. Only in one out of nine experiments carried out under light chloroform anæsthesia did doses of 0·1–4·0 mg. raise the blood-pressure; even this rise was only 20 mm. Hg and passed off in two minutes. These responses were not related to the initial level of arterial blood-pressure, and they were unaffected by atropinisation.

In view of the published findings of other workers, we paid special attention to the action of veritol in experiments in which the blood-pressure had been gradually lowered by a slight increase in the depth of the chloroform anæsthesia. The fall in blood-pressure produced by an increase in the depth of the chloroform anæsthesia may in part have been due to cardiac failure; but in our experiments no electrocardiographic changes were observed, and the blood-pressure returned rapidly to normal when the administration of chloroform was stopped. It seems therefore that veritol may not raise the blood-pressure when heart-failure has been a contributory factor to the initial arterial hypotension.

An increase in arterial blood-pressure by as much as 20 mm. Hg, besides some negative results, was observed after intravenous injection of 0·2–4·0 mg. of veritol in cats under cyclopropane anæsthesia. In no case did any subsequent injection raise the arterial pressure, but in one experiment 10 mg. of veritol, injected ten minutes after an initial administration of 1·0 mg., produced a fall of 50 mm. Hg; recovery to the pre-injection level was complete after five minutes.

ELECTROCARDIOGRAPHIC CHANGES

Under ether anæsthesia.—The action of veritol in cats under ether anæsthesia was studied electrocardiographically. Serious disturbances of cardiac rhythm or of myocardial function were not observed. Occasional ventricular extrasystoles were recorded in a few cases, and one cat showed slight changes in the T waves after intravenous injection of 0·5 mg. of veritol.

Under cyclopropane anæsthesia.—In 3 out of 5 cats under light cyclopropane anæsthesia serious cardiac disturbances developed after the administration of veritol; 2 of these cats were atropinised. Many ventricular extrasystoles appeared forty-five seconds after the injection of 0·5 mg. of veritol; two and a half minutes after the injection there was bigeminal rhythm. The electrocardiogram was normal again eleven minutes after the administration of veritol. The blood-pressure increased in this particular instance only by 15 mg. Hg and was back to the pre-injection level two minutes after the injection. Rapid ventricular rhythm (ventricular tachycardia?) developed in another cat after the injection of 2·0 mg. of veritol; the arterial pressure did not change in this experiment. The ventricular rhythm lasted three minutes. Subsequent injection of the same dose of veritol, causing only a slight temporary rise in arterial pressure, produced rapid ventricular rhythm lasting

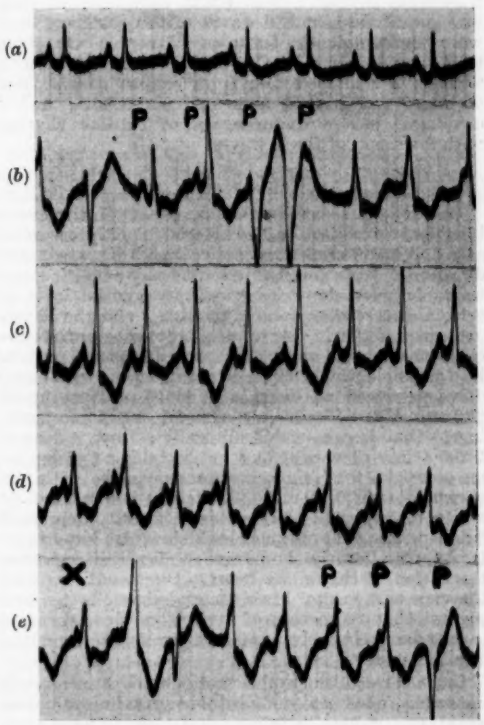

FIG. 2—Electrocardiograms from lead II showing cardiac disturbances produced by veritol under chloroform anæsthesia: (*a*) before injection of veritol, showing sinus rhythm; (*b*) 1½ min. after injection of veritol, showing auriculoventricular dissociation, ventricular beats originating from various foci; (*c*) 3½ min. after injection of veritol, showing sinus rhythm and bundle branch block, complete form alternating with less complete form; (*d*) lowering of R and gradually progressive depression of S–T segment with increase of damage to myocardium; (*e*) complete auriculoventricular dissociation after X.

eighteen minutes. Cardiac rhythm then returned to normal.

Under chloralose anæsthesia.—Severe cardiac disturbances were seen after injection of small doses (0·2–0·4 mg.) of veritol. In one experiment the blood-pressure increased from 160 to 220 mm. Hg; rapid ventricular rhythm, first of left and subsequently of right ventricular type, developed; this was followed after five minutes by a bigeminal rhythm. Fourteen minutes after the injection sinus rhythm was restored, but the T waves were now sharply inverted. Nodal rhythm was observed in another experiment, and the T waves were flattened. These changes lasted twenty-three minutes after the intravenous injection of the drug.

Under pentothal anæsthesia.—Severe cardiac disturbances were observed in 3 out of 5 experiments. These disturbances consisted in many ventricular ectopic beats originating from three foci and lasted up to ten minutes after the injection.

Under chloroform anæsthesia.—Intravenous injection of veritol 0·1–2·0 mg. produced in every instance grave cardiac disturbances (fig. 2). Massed ventricular extrasystoles, from as many as eight different foci; rapid ventricular rhythm; bigeminal and trigeminal rhythm; ventricular complexes of very low amplitude; and T waves of the coronary type were the commonest features. Atropine was given to 4 cats before veritol was injected. Of these 4 animals 2 remained free from serious cardiac disturbances; 1 showed aberrant conduction; and 1 developed severe disturbances of cardiac rhythm with inversion of the T waves.

COMMENTS

Our experiments show that the effect of intravenous injections of veritol on the arterial blood-pressure in cats under different anæsthetics varies in extent and duration. We were unable to find any definite correlation between depth of anæsthesia, initial level of arterial pressure or dose of the drug, and the blood-pressure reaction. Our results do not substantiate the claim that veritol raises the arterial pressure only to its "physiological level"; in many experiments small doses produced an increase in blood-pressure up to 220 mm. Hg. We used a range of dosage corresponding to that recommended clinically; thus, a dose of 0·2–0·4 mg. of veritol in a cat weighing 3–5 kg. is, on a weight for weight basis, comparable with the clinical dose of 5–20 mg. The failure in our hands of veritol to raise the blood-pressure already depressed by deepening chloroform anæsthesia is also important, for it contradicts the claims made that veritol improves the action of the failing heart. Our results support the view that veritol has a tachyphylactic action and suggest that the action of veritol on blood-pressure cannot be exclusively explained by its effect on the blood stores.

Our electrocardiographic findings are of interest in view of the clinical use of veritol in operative and post-anæsthetic failure of the circulation. The disturbances of cardiac activity, which were slight solely under pure ether anæsthesia, are sufficiently severe to recommend the utmost caution in the use of veritol. They cannot be explained by a sino-aortic cardiac reflex, for they developed independently of the nature of the blood-pressure reaction and were still observed in atropinised animals. Since Levy's (1914) work on ventricular fibrillation under chloroform anæsthesia the tendency of the heart to develop disturbances of rhythm under this anæsthetic is well known. It has also been observed that irregularities of the heart beat develop under cyclopropane anæsthesia (Beecher 1938). However, we wish to point out that: (1) no electrocardiographic signs of cardiac disturbances were observed in the pre-injection control period of our experiments; (2) the irregularities of cardiac function developed after the administration of veritol; and (3) cardiac disturbances were produced by veritol under such different types of anæsthetics as ether, chloroform, pentothal, chloralose, and cyclopropane.

Recent biochemical and pharmacological studies suggest that the action of veritol resembles in many ways that of ephedrine. Kwiatkowski (1940) deals with this aspect of the problem, and his experiments show that the analogy between these two substances is fairly complete. The tachyphylactic action of veritol may be due to the same mechanism as the well-known immunity of the organism to a second injection of ephedrine, which often causes a fall in arterial pressure. As regards the toxic action of veritol on the heart, it may suffice to refer to Hildebrandt and Mügge (1931), who recommended caution in the use of ephedrine in circulatory collapse because of its toxic action on the heart. Our work appears to suggest that a similar caution ought to be observed in the clinical use of veritol.

SUMMARY

(1) The action of intravenous injections of veritol on arterial blood-pressure and on the electrocardiogram was studied in cats under ether, chloralose, pentothal, chloroform, or cyclopropane anæsthesia.

(2) The rise of the arterial blood-pressure after administration of veritol in cats under ether, chloralose, or pentothal anæsthesia varies in extent and duration. There is no direct relationship between the blood-pressure response and the dose of veritol or the depth of anæsthesia. The blood-pressure response did not depend on its initial level. There was no difference in the results obtained in atropinised and non-atropinised animals.

(3) Veritol has a tachyphylactic action in cats; the second injection of the drug may produce a fall in blood-pressure.

(4) Veritol has no pressor action in cats under chloroform and only a negligible pressor action in cats under cyclopropane anæsthesia.

(5) Intravenous injections of veritol produced slight disturbances of cardiac rhythm in cats under ether anæsthesia; severe disturbances of cardiac function were electrocardiographically recorded in cats under pentothal, chloralose, cyclopropane, or chloroform anæsthesia. These changes were also observed in atropinised animals.

(6) The action of veritol is compared with that of ephedrine, its close chemical relative.

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THE Pocket Medical Dictionary compiled by Miss Lois Oakes, S.R.N., with the assistance of Prof. T. B. Davie (E. and S. Livingstone. 1940. Pp. 409. 3*s.* 6*d.*) has now reached a fourth edition. The definitions are necessarily extremely brief, for seven to twenty words are dealt with on a page and the book will well and truly go into the waistcoat pocket. It is intended for medical students especially during their first two or three years, but most of the words included are those used in clinical medicine. In the next edition acrodynia should not be given as a synonym of pink eye.

SPONTANEOUS HÆMOTHORAX

REPORT OF A CASE

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THE following case appeared to us to be sufficiently out of the common to be worth recording.

The patient was a private in the Scots Guards, aged 26, of strong physique. On Sept. 25 he was on parade at St. James's Palace for the changing of the Guard. After parade (about 11 A.M.) he complained of sudden pain in the right chest. He reported sick about 3.30 P.M. and was seen by the battalion medical officer, who put him straight to bed and visited him again about two hours later, when he found him in considerable pain. On examination of the chest there were signs of pleural involvement on the right side; the medical officer thought that some fluid was present. The man's general condition being evidently serious, arrangements were made for his transfer to hospital. He was admitted to St. Luke's Hospital, Chelsea, at 9 P.M. the same evening.

On admission he appeared somewhat collapsed. The temperature was 99·2° F., the pulse-rate 108, and the respiration-rate 26. Physical examination of the chest showed dullness to percussion on the right side, with displacement of the heart's apex-beat to the left. The patient passed a restless night, during which he vomited twice. The next day his general condition was much worse. The note on his case sheet was as follows: "Impaired percussion note on the right side, especially at base; tubular breathing with increased vocal resonance lower half of the right lung; abdomen held rigid, but no diminution of liver dullness; no clinical signs of acute abdominal mischief." Mr. Kenneth Heritage, who saw him early in the afternoon, was satisfied that no surgical abdominal emergency was present, and he advised that a chest specialist should be called in.

When seen by one of us (M. D.) at 6.30 P.M. the patient was much collapsed and was restless. The pain in the chest, though still present, was less severe than at the onset of his illness. The temperature was subnormal (96·2° F.), the pulse-rate 140, and the respiration-rate 28. There was now absolute dullness over the lower half of the right lung, the percussion note over the upper half being impaired. Faint amphoric breathing was audible below the angle of the scapula. The cardiac displacement was less obvious than on admission, but the impulse was diffuse and feeble, and the pulse at the wrist was scarcely palpable. A needle was put into the chest behind on the right side, and about 10 c.cm. of fluid, which appeared to be pure blood, was removed from the pleural cavity. Shortly after this he had another attack of vomiting.

The man's condition was now so grave that further exploration of the chest at the moment was regarded as out of the question. It was thought, however, that immediate blood-transfusion might check the internal hæmorrhage, and that further measures might be adopted later if the general condition showed any improvement. Two pints of blood were given at 7.30 P.M. In spite of this the patient's state became steadily worse during the night, and he died at 1.30 A.M. on the 27th.

Post-mortem findings. (C. K. S.).—The sole findings of interest were confined to the chest cavity, and description will be limited to these. No variation of pressure was evident on making an opening into the right pleural cavity; it contained approximately 1500 c.cm. (2¾ pints) of fluid and clotted blood, fresh and uninfected, and this had compressed the right lung to a degree which had rendered it completely airless. The entire lung had become shifted, together with the mediastinum, to the left, though this had been limited by compensatory emphysema of the left lung. The blood was removed with great care, and the lung lifted gently forwards in order to find the bleeding point. Blood was at once seen issuing from a small band of adhesions which united the diaphragmatic surface of the right lower lobe, close to the mediastinum, to the right cupola of the diaphragm.

Close to the apex of the upper lobe of this lung, and immediately adjacent to a small puckered apical scar, there lay a bulla measuring 3 × 5 mm., now collapsed. Along the upper border of the "neck" of this bulla lay a line of crimson clot, 4 mm. in length; it was thought that this marked the site of a linear rupture of the bulla, and microscopy showed this to be so. A further scar lay in the visceral pleura, immediately below the bulla, but there was no evidence, either to the naked eye or subsequently on microscopy, of active tuberculosis, and the regional lymphatic glands were healthy. No other marks of disease were found. The deceased was in other respects healthy.

The interpretation furnished to the coroner was that spontaneous rupture of the apical bulla, a mechanical sequela of healed apical tuberculosis, had caused sudden pneumothorax accompanied by immediate collapse of the lung. This process had stretched and torn the basal adhesions; bleeding had continued to take place from these slowly up to the time of death, which was due to hæmothorax. It was not thought that there was any reason to suppose that the process was other than natural.

DISCUSSION

The features of this case, both clinical and pathological, differ but little from those of cases already reported in the literature. The most comprehensive account we have seen is that furnished by Jones and Gilbert (1936), who described a case of "idiopathic hæmo-pneumothorax" which ended fatally on the thirty-eighth day. To this report they added an analytical review of the literature covering the past fifty-five years, with special emphasis on cases of so-called "hæmo-pneumothorax in the apparently healthy." Of the total of 24 cases (including 1 of theirs) they discovered 19 of this type, 17 of which they analysed. The age-limits in these were 17–44 years; in 62·5 per cent. of the cases the accident took place in the third decade. There was no special incidence on one side rather than the other; in 9 cases the bleeding took place into the right pleural cavity, and in 8 cases into the left. All these patients were males. Of all the cases 6 ended fatally, and in 3 instances death took place within twenty-four hours of the onset of the illness. In most of those patients who survived the initial shock there was slow and steady improvement. In the 13 patients who ultimately recovered the course of the disease was prolonged, the average duration being fifty-nine days (shortest period ten days, longest period ninety-eight). One feature of considerable practical importance, to which they called special attention, is the incidence in 9 cases of abdominal symptoms (abdominal pain, nausea, vomiting, and, in 1 case, diarrhœa). In 5 of these cases they noted that surgical measures were contemplated, and in 2 of them exploratory laparotomy was performed, though the abdominal findings were negative.

Reference to the prominence of abdominal symptoms was also made by Milhorat (1931, 1937), who reported the case of a male Cuban, aged 21, who was seized with sudden pain in the left shoulder, spreading to the præcordium and gradually to the whole of the chest. About twelve hours later this patient

developed pain in the abdomen, with tenderness over McBurney's point and below the left costal margin. The illness ended in complete recovery, and a follow-up after an interval of six and a half years showed that the patient was still in good health. Milhorat noted that radiography of the chest showed evidence of calcification of the pleura on the affected (left) side and thickening of the pleura in the region of the left apex. That this was associated with tuberculous disease is suggested by the fact that there was a history of an attack of dry pleurisy eleven months before the hæmo-pneumothorax.

Pathogenesis.—Of the various causes of hæmothorax by far the commonest and the most easily intelligible is trauma. Street and other accidents provide the vast majority of these cases, either from laceration of the lung, as presumably in Morlock's (1933) case, or from injury to the intercostal arteries from fractured ribs. Gunshot wounds, though uncommon except in war, also provide a proportion of examples of traumatic hæmothorax. Rupture of a thoracic aneurysm into the pleural cavity may also be a cause, and in a few instances this may be due to erosion of the aorta by malignant disease. The uncommon causes comprise the type of case described in this article, besides those due to active tuberculosis. Of the latter Hopkins (1937) described several in a review of 49 cases, and Jones and Gilbert (1£36) 3 cases. Very rarely the condition is associated with malignant disease or with caries of a rib.

The causation of so-called primary idiopathic hæmothorax is less obvious, especially in those instances in which recovery takes place and there is no previous history suggesting tuberculosis. In those cases which come to necropsy, we believe more care would reveal the cause. The explanation given by us in this instance is undoubtedly proper. The basal adhesions, which were clearly the source of profuse hæmorrhage, were comparatively soft and vascular and were evidently not of very long standing. There was in this case, as is so common, no history of pleurisy or anything to suggest that this man had at any time had an active manifestation of tuberculosis in the clinical sense, the healed apical scar being regarded as familiar evidence of the capacity of the healthy body to deal quietly with its original infection with the tubercle bacillus.

In two fatal cases of hæmothorax reported by one of us (Davidson 1935) pleural adhesions were found post mortem. In the first of these there were old band-like adhesions near the apex of the lung on the opposite side to that of the hæmothorax; in the lung tissue below the adhesions was a small scar due to an old healed tuberculous focus. This was the only evidence of a tuberculous infection. The lung on the affected side was completely collapsed from the pressure of the blood in the pleural cavity, but no definite intrinsic lesions were found, nor was the cause of the bleeding clearly established. The second case was of considerable interest from the pathogenic aspect in view of the histological report furnished by Turnbull. According to this the adhesions found on the medial aspect of the right upper lobe and on the parietal pleura over the pericardium were vascular and, when pressed with the finger, exuded blood from the orifices of large venous or vascular spaces. The microscopical examination confirmed the opinion formed at necropsy that the hæmopleura was due to traumatic hæmorrhage into and from delicate vascularised pleural adhesions. The adhesions were associated with chronic bronchopneumonia.

Treatment.—There is little to be said about the treatment of this acute emergency. It is generally agreed that conservative treatment is indicated, at least in the early stages of shock. In Morlock's (1933) case the blood was removed by continuous suction drainage, and the ultimate outcome was wholly satisfactory. In our case the question of aspiration of fluid was discussed by the clinicians in consultation, but it was decided, in view of our ignorance of the exact conditions within the pleural cavity, to leave well alone. It was thought that removal of a large quantity of blood might further increase the bleeding by allowing a rapid re-expansion of the lung. The patient's condition at the time was such that thoracopic investigation to determine the cause of hæmorrhage could not have offered any reasonable hope of success. The rapid course of subsequent events seems to justify our decision.

SUMMARY

The case is reported of a spontaneous hæmothorax in an apparently healthy man aged 26. Necropsy showed that an apical bulla, due to healed apical tuberculosis, had ruptured spontaneously, causing sudden pneumothorax, which in turn had stretched and torn basal adhesions, leading to slow and continuous hæmorrhage. Other published cases, both traumatic and idiopathic, are briefly reviewed.

Our acknowledgments and thanks are due to Sir Frederick Menzies for permission from the London County Council to publish this case; to Dr. E. T. Holland, the medical superintendent of St. Luke's Hospital, for allowing us to use the clinical notes and charts; and to Mr. Neville Stafford, H.M. coroner, for permission to publish an account of the necropsy.

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A FURTHER CASE OF LABYRINTHECTOMY

By Macleod Yearsley, F.R.C.S.

EAR, NOSE AND THROAT SURGEON TO THE CHALFONTS AND GERRARDS CROSS HOSPITAL; FORMERLY SENIOR SURGEON TO THE ROYAL EAR HOSPITAL, LONDON

Since the publication of my paper on the operative treatment of labyrinthine vertigo in The Lancet, 1938, **2**, 618, in which I described five cases of deliberate destruction of the semicircular canals performed by me between 1908 and 1933 for incurable and disabling labyrinthine vertigo, I have now a further successful case to record.

This sixth example was in a married woman, aged 54, who was referred to me by Dr. M. de Lacey in September, 1938. She complained of troublesome vertigo and constant tinnitus in the right ear, both of which had been present for four years and had of late become so much worse that she was never without a distressing sense of instability. On several occasions she had fallen backwards, striking her head. The attacks of vertigo were always heralded by an increase of the tinnitus, which was of a rushing and throbbing character, and by an apparent movement of objects, which, so far as she could say, was from right to left. During the first three years of the attacks vertigo was usually followed by vomiting, described by her as "in one gush."

On examination the tympanic membranes showed diminution of the normal lustre. The mobility of the

left drum was normal; that of the right was not tested, for fear of causing vertigo. Neither membrane showed any scarring, and there was no history of discharge. The nasal septum was much deflected to the left. All the teeth had been removed, and the patient was wearing upper and lower dentures. There was slight coarse nystagmus on deviation to the right, and Romberg's test elicited an obvious tendency to sway forwards. Hearing tests gave the following results: bone conduction to the 35 sec. C 128 fork was R 15 sec., L. 25 sec.; Rinne R negative, L positive; lower tone limit R. C_1 (256), L. 3 C 16; Galton whistle R?, L normal; voice R close to, L 20 ft.; whisper R 0, L 20 ft.

The operation was performed in the country on Oct. 16, 1938, under avertin and ether anæsthesia. The right auricle was turned down by Lake's incision and the tip secured to the neck with a suture. The mastoid was cellular, making the antrum difficult to locate, and the lateral sinus was wounded slightly but was easily controlled by packing and gave no further trouble. The antrum was widely opened, and the tympanic membrane and major ossicles were removed. The ampulla of the external semicircular canal was opened and followed into the vestibule, and the ampullæ thereof and of the superior and posterior canals were curetted. The vestibule was swabbed with a 2 per cent. solution of formaldehyde. Finally the cavity was packed and the auricle readjusted, the lower part of the original incision being left open for the packing of the lateral sinus.

Since the operation was performed at a distance from London, I was unable personally to superintend the progress of the case. Unfortunately, for some reason unknown to me, the healing of the wound was complicated by suppuration, with exuberant granulations, during which facial paralysis developed. I did not see the patient again until April 5, 1939. She had, the day before, experienced an attack of vertigo with vomiting. But she no longer had falls. The cavity had not yet healed and showed much flabby granulation tissue posteriorly. I gave advice about treatment and asked to see the patient again within a few weeks. I heard nothing of her, however, until January, 1940, when she wrote saying that since her last visit she had slowly improved, and that for just on twelve months she had been free from vertigo and had not fallen once, while the facial paralysis was rapidly improving.

MEDICAL SOCIETIES

BRITISH PSYCHOLOGICAL SOCIETY

At a meeting of this society held on March 13, the chair being taken by the president, Dr. DENIS CARROLL, a discussion on the

Changes in Psychic Economy

caused by the war was opened by Dr. EDWARD GLOVER. For the second time in a quarter of a century we were, he said, likely to throw away a unique opportunity for psychological research and discovery. Public bodies will not take the lead, and once more it falls to medical psychologists in their private capacity to do so. Since the last war a great deal has been added to our knowledge of the unconscious and of psychopathological states—in particular the importance of early persecutory anxieties and the depressive mechanisms. These are the foundations on which research must be built. The most urgent problem is that of technique. The most rapid progress has so far been achieved by proceeding from the relatively simple pathological state to the relatively complex character-change. The course of neuroses and psychoses is more predictable than the lives of normal individuals. In order to establish effective correspondences between psychopathological findings and changes in normal behaviour, it would be necessary to establish characteristic war reactions for each pathological state and so build up a composite test pattern for the average citizen.

Apart from a general increase in anxiety-readiness, he had not observed any change characteristic of any one group, except that children have a common tendency to disturbance of sleep and sporadic enuresis. In the average population it is, however, not difficult to demonstrate a great variety of changes, mostly of a psychoneurotic type: transient conversions affecting the gastro-intestinal systems, mild anxiety reactions, a tendency to obsessional ritualisation, and, perhaps more generally, a subdued depressive reaction. In the world war the community celebrated the outbreak hysterically, proceeded into a kind of slow obsession disturbed from time to time by phases of paranoidal reaction, sank gradually into depression, broke into a short-lived mania at the close of hostilities, and, after a phase of active illusion formation, dropped back into a secondary depression. It may now be working through an exacerbation of the end-phase of this depression. It is too soon to say whether more active responses to this war may not simply be delayed.

One of the biggest obstacles to research is the mechanism of repression and displacement, which mask and distort reactions. Moreover, there is no comparison between the external situations of a peace-time and of a war-time neurosis: there is a much greater degree of reality in the environmental stimuli of war-time, with its stress and danger. In war-time, also, the psychic reaction of the human environment is entirely different. The group itself is sick, and so provides a neurotic as well as a reality stimulus for the individual. There exists, however, nothing with which to contrast the behaviour of a sick group; it is still a law unto itself. Moreover, many of its war-time reactions are not abnormal. Its condition provides a special precipitating factor for the individual and so disturbs the ordinary peace-time assessments of clinical psychology.

The fewer the conclusions drawn the better, but a considerable amount of bold speculation is highly desirable. The psychologist has now a glorious opportunity of examining the effect of standard precipitating factors on different types. Observers should concentrate on the changes noted in different sections of the group corresponding roughly to the differentiated parts of the individual mind: ethical and religious organisations, seekers after pleasure, courting couples, and public services and undertakings. They could also note the positive expressions of aggressiveness in the community, any outcropping of perversions, and the activities of inhibiting institutions—again including public ministries. There is then need for a reconstruction through analytical inferences of the total psychic function of the national group in war-time. Research may lead to a rediscovery of the importance of totemism in the civilised societies of twentieth-century Europe.

Dr. H. G. BAYNES pointed to the general underground stampede or migration from civilised Christian standards, a movement of which Hitler and Stalin

are the most prominent symptoms. Individuality is today struggling, he said, against an insidious spiritual infection in which its true interests are liable to be submerged by formidable collective forces coming either from without or from within. Savage repression of the individual seems invariably to precede and accompany periods of collective transition. Lemmings, salmon and certain other animals also reveal a dangerous lowering of vigilant, adapted behaviour during periods of mass migration. In spite of apparently successful conquests, the people of the aggressor nations have suffered considerable privations and deterioration in health. C. G. Jung has called this mass-possession the *furor teutonicus*. It must be assumed to be a latent potentiality of the German unconscious which has remained concealed like an underground mine since barbarian times. When the civilised Christian superstructure was undermined by defeat in war, physical privation and a deep and galling sense of inferiority, "Wotan" swept the nation away like a whirlwind. The individual man is hunted back into a herd collectivity by a dæmonic spirit which Hitler himself identifies with Antichrist, and which has devoured Hitler's own individuality. The Russian hordes who attacked the individual Finns were driven by the same spirit, and it affects the whole of civilised mankind as an unconscious undertone. There has been an incredible acceleration of evolutionary momentum during the industrial age, and the evolutionary stream has gone into machinery instead of into consciousness. Western people need to find the way to spiritual maturity, and the Christian path is indispensable. The essential meaning of the Christian symbolism leads to the problem of the opposites. A new kind of individual consciousness must emerge if the cultural heritage of the country is to be saved, but psychical adaptation involves a view of the historical depths of the collective unconscious.

Prof. KARL MANNHEIM, Ph.D., said that to the sociologist, group conflicts are not merely quarrels but also struggles and competition between different attempts of the individuals at readjustment. Competition selects those responses which have the greatest survival value. The field-worker ought first to observe how the new pattern of the successful action emerges: how it is accepted, how it spreads, its modifications in further unconscious patterning, and its later institutionalisation. In this focus of struggle the function of leadership can adequately be studied. The psycho-analyst might say why in certain decisive situations certain pathological types are more apt to produce the new pattern of adjustment—perhaps because, never having been able to follow the rut of routine, they have a greater chance than the tradition-bound normal type of finding a new and adequate response. The study of the pathological type can here most organically be linked up with that of the so-called normal.

The main task is to connect inside information gained through the methods of depth psychology with the major changes in the outside world. The ultimate aim is to correlate the mechanisms of the individual mind with the social mechanisms operating upon it. Purely descriptive field-work or observations in artificially-created conditions cannot adequately establish the pattern of dynamic research: the worker must aim at a dynamic penetration into the life of the groups. In addition, his new task is to ascertain influences coming from a far distant focus in society and not from the family or the smaller community. He must incessantly relate the pathological form of adjustment to the normal one, and ascertain the function of the pathological in the different stages of the social process.

It would be quite easy to organise a service which would collect and pool all the inside information available in private and clinical practice as to the typical reactions to war. The technique developed by H. Lasswell in "Psychopathology and Politics" and called by him the "prolonged interview" might give valuable data. This is a kind of brief analysis in which a trained psycho-analyst investigates the inner life-history of selected persons who themselves take a deep interest in psychology—to reconstruct the subject's fundamental system of ideologies and valuations and his reactions to the current conflicts in his life. It would also be valuable to suggest to certain people that they should keep a war-time diary which would partly consist of answers to certain probably important questions, and partly of notes written from free association and left entirely to the diarist. Sociological observation ought not to be confined to the observation of groups, but should include the clinical study of individuals. Any of the typical conflicts breaking out in connexion with the evacuation would reveal the dynamic interconnectedness of psychological and social factors. A war-time diary in which a psychologist and a sociologist collaborated would throw light on influences coming from a distant focus. The main task would be to fix the chief emotional trends as they grew and developed, ebbed and flowed. Posterity will easily reconstruct the more tangible facts, but we shall very soon forget how long the first shock after the war lasted, when people returned to their ordinary occupations, when people ceased to carry their gas-masks, when the intellectual began discussing peace aims, federal union and the rights of man—activities which may later be interpreted as results of collective escape mechanisms. Such a diary would make an excellent background for individual experiences.

A kind of clearing-house should be created for current conflicts and difficulties. Workers in this field would soon find out that in the typical difficulties there are always some individuals who find the pattern of correct external and internal adjustment to the changed situation. In modern large-scale society the individual cannot be expected to find an adequate adjustment to sudden changes by himself. In the old parochial world there was a kind of primitive handing-over of the successful psychological adjustment to one's neighbours. In the modern world this must naturally be organised, and modern social services should provide help of this kind. If psychologists were able to link up their scientific urge to knowledge with some such practical purpose, they would more easily find support both from the public and from the authorities.

DISCUSSION

Mrs. M. SCHMEIDEBERG said that since 1932 most of her patients had been constantly preoccupied with the political situation and fear of war. This tendency increased during 1939 up to Christmas, but since then practically none of them had mentioned war. Reaction to this war started as a depression, with a tendency to pessimism about the prospects of this country and not about those of the enemy. This was especially marked in people with sexual inhibitions, and is perhaps connected with the conviction that war should be conducted without hate—a result of suppression of normal hostility. Many reasons may be given for it: pacifist propaganda, the great superiority of this country to Germany, reaction from the last war and absence of wish for war.

Dr. A. T. M. WILSON pointed out two different sets of conflicts related to the present situation. He asked whether many of the current conflicts did not

spring from a general tendency to develop a social structure in which ideas of quality should replace those of quantity and prestige; and from a general attempt to leave behind a level of society which was basically anal-erotic.

Miss BARBARA LOW, referring to the displacement of the aggressive instinct, suggested that some of it was expressed in a peace meeting which she had attended, largely composed of young men of service age, a number of whom had spontaneously and effectively ejected some Fascist interrupters.

Dr. DORIS ODLUM sounded a warning against confusion between the overt and the unconscious objects of a group, which are apt to be quite different. Many people join a group from a motive other than that for which it is supposed to exist—e.g., the attempt to compensate for an unconscious urge, to escape from the feeling of guilt associated with sadistic impulses. Anything which happens to upset the balance of the group brings the sadistic element to the surface.

Dr. G. C. BERG said that an army officer came to him immediately on the outbreak of war with a serious depression for which he was invalided out of the army. He developed intense hatred against the analyst and after a time felt much better and wanted to rejoin the army. Perhaps the depression was originally due to successful repression of his hate against the enemy.

REVIEWS OF BOOKS

Pneumonia

With special reference to Pneumococcus Lobar Pneumonia. By RODERICK HEFFRON, M.D., medical associate, the Commonwealth Fund; formerly field director, pneumonia study and service, Massachusetts Department of Public Health. London: Humphrey Milford, Oxford University Press. 1939. Pp. 1086. 24*s*.

IN our review of the "Biology of the Pneumococcus," the companion volume to this, it was remarked that the layman would be amazed at a book of that size being written round a single coccus. There will be both amazement and admiration over this magnum opus on lobar pneumonia, for apart from a short account of pneumonias due to other bacteria and brief references to bronchopneumonia there are over a thousand pages about pneumococcus lobar pneumonia and its complications. The exhaustive analysis of the literature which has gone to the compilation of the book was no scissors and paste affair. On almost every page there is evidence of a sound judgment of other people's work, and if American literature often gets pride of place it cannot be said that European studies have been overlooked.

The chapters on pathology, immunity and experimental infection are extraordinarily well done. Loeschcke's views on the pathology of the disease are contrasted with more orthodox beliefs and with the recent work of Robertson and his colleagues on pneumonia in dogs; the contention of Lauche that lobar pneumonia is an allergic disease is dealt with in a later chapter. The mechanism of natural and acquired immunity in animals and in man is discussed at length and the conclusion is reached that "immunity to the pneumococcus is largely dependent upon an integrated system of cellular reactions conditioned by the presence in the blood and tissue fluids of specific antibacterial substances of a sensitising nature." The pathogenesis of pneumonia and the possible routes of infection are next considered; the author's view that the infection is air-borne and bronchiogenic in origin will doubtless be disputed. In the chapter on epidemiology the rôle of contact and convalescent carriers in the spread of the disease is stressed, and prominence is given to minor respiratory infections as a predisposing factor.

In the clinical section, symptomatology is dismissed in two short chapters—physical signs get only four pages—and more space is given to such special features of the disease as relapse and recurrence, delayed resolution and complications. The various methods for type-identification are fully described, and the American view that horse antiserum is unsuitable for the Neufeld *quellung* reaction is maintained. Some may also quarrel with the statement under prognosis that the leucocyte count is an unreliable prognostic guide. Serum therapy, with horse or rabbit antiserum, is discussed very fairly, and Dr. Heffron reviews the earlier findings with sulphanilamide and sulphapyridine. In the last chapter he sets out some of the problems which still confront us—standardisation of typing and therapeutic antisera, prophylaxis and epidemiology. The index is a complete one. Altogether the book stands by itself as the most complete extant record of our knowledge on lobar pneumonia.

Neurology

By the late S. A. KINNIER WILSON, M.D., D.Sc., F.R.C.P., formerly physician, National Hospital, Queen Square; senior neurologist, King's College Hospital. Edited by A. NINIAN BRUCE, M.D., D.Sc., F.R.C.P.E. London: Edward Arnold and Co. 1940. 2 Vols. Pp. 1838. £4 4*s*.

WHEN Dr. Kinnier Wilson died nearly three years ago he left the manuscript of his textbook almost complete, and his literary executor and brother-in-law undertook the task of revising it for the publishers. The result is a comprehensive reference work on neurology, approached largely from the clinical side. That is to say the development of the nervous system, its anatomy, physiology, histopathology and biochemistry, while not omitted, fill only a subordinate position. The arrangement of the subjects mainly follows the traditional nosological pattern, though here and there the author has struck an original note by introducing such ætiological chapters as "neurotubercle" and "gonococcal affections of the central nervous system," and by employing the continental term "neuro-anæmia." Neurosurgical subjects are of course included, but neuro-psychiatry finds no place, with the exception of the organic psychoses and some chapters on the neuroses (subdivided into the "motor," "sensory" and "reflex" neuroses) which will not be likely to satisfy the average psychiatric critic. Presumably the manuscript went to the publishers unfinished, for a number of important subjects are not mentioned. Thus injuries of the head and spine are not dealt with; nor are the cerebral symptoms of a psychomotor or psycho-sensory nature, including such important manifestations as aphasia, apraxia and the agnosias as well as the thalamic syndrome. The syndrome of the posterior inferior cerebellar artery is not considered in detail, nor are the neuro-avitaminoses, the problem of the prolapsed nucleus pulposus or the neurological complications of Paget's disease. It is unfortunate, too, that there is no mention of the neurological researches of the past two or three years—the uses of benzedrine; of quinine or alcohol in the relief of myotonia; diphenyl hydantoinate; vitamin B_1.

But all who knew and appreciated Kinner Wilson will re-live, as they turn the pages, the familiar accents of his brilliant lectures and demonstrations. The writing is characteristically Wilsonian; the teaching is always clear and stimulating, often original and unorthodox, and at times amusing and sparkling.

L'hématologie clinique et laboratoire

By P. ÉMILE WEIL, médecin des Hôpitaux de Paris. Paris: Masson et Cie. 1939. Pp. 268. $3.25

THIS paper-covered book includes laboratory procedure and the methods of approach to the diagnosis of blood diseases at the bedside. No attempt is made to deal with theory nor to describe in detail the various syndromes but vital points for understanding such as the development of the blood-cells are clearly and briefly set out. Instructions for the cytological and physical examination of the blood are to the point and where there are several available methods Dr. Weil gives reasons for his own choice. One of the best sections of the book is the one on puncture of the bone-marrow, a subject on which he is specially competent to speak, and he shows the prognostic as well as diagnostic value of the operation. Of great interest is his view that puncture of the spleen, liver and lymphatic glands is often necessary to complete the study of the hæmopoietic centres and though in this country we can only congratulate him on his luck in diagnosing 17 of 19 patients suspected of metastatic cancer by liver puncture it is also to be remembered that we often forget the possibilities of this technique. The second part of the book provides a working method for the clinician with chapters on the examination of patients suffering from anæmia, hæmorrhage or hæmoglobinuria, and on the diagnosis of patients with a big spleen or swollen lymph-nodes. The many drawings and beautiful coloured plates are by a well-known artist. The book is intended for students, practitioners and laboratory workers and fills the bill admirably.

Practice of Allergy

By WARREN T. VAUGHAN, M.D., Richmond, Virginia. London: Henry Kimpton. 1939. Pp. 1082. 50*s*.

THIS is a sequel to Dr. Vaughan's "Allergy and Applied Immunity," which was designed for both doctor and patient. Advances on the chemical side of the subject have made a subdivision necessary, and the present volume is designed for the specialist, while the subject is presented to the patient in a small companion "Primer of Allergy." Dr. Vaughan paraphrases Fournier's famous dictum "To know syphilis is to know medicine" as "To know allergy one must know medicine," and perusal of these pages will convince the reader that the allergist must also know his botany, mycology, dietetics and bacteriology, as well as something of dermatology, otolaryngology, gastro-enterology and pædiatrics.

Dr. Vaughan produces evidence that at least half of the population are allergic, and he discusses not so much why some are allergic as why all people are not allergic. The capacity to become sensitised is present experimentally in all human beings, differing only in degree. This allergic response depends in part on inheritance, in part on the nature of the allergen and in part on the degree and duration of exposure. The work is rather verbose for the ordinary reader. Thus, eight pages are taken up with the conjunctival test, which is little used nowadays. There is a full account of the leucopenic index elaborated by Vaughan and Thomas, which other workers have not found so informative about food sensitiveness as did the originators. The section on foods and their avoidance will be useful only for reference, being highly historical and highly botanical, as is the section on moulds and fungi. Dr. Vaughan deals with the practice of allergy mostly from the ætiological point of view and makes scant mention of the individual manifestations such as asthma, cutaneous symptoms and migraine. The sections on drug allergy and contact allergy are much better done than those on the common symptoms.

The book is well printed, illustrated and indexed, the references are full and accurate, and the specialist will find in it a complete exposition of his subject.

An Index of Treatment

(12th ed.) Edited by Sir ROBERT HUTCHISON, Bt., M.D., P.R.C.P., consulting physician to the London Hospital and Hospital for Sick Children, Great Ormond Street; assisted by REGINALD HILTON, M.D. Camb., F.R.C.P., physician to St. Thomas's Hospital. Bristol: John Wright and Sons. 1940. Pp. 996. 42*s*.

THIS established book of reference needs no fresh description. It is written for the general practitioner and contributed to by a long list of distinguished men. It gives the impression of being adequately up to date, yet chary of embracing new notions too soon and reluctant to relinquish old teaching too readily. The four years since the eleventh edition have seen the expansion of chemotherapy; these and other advances have naturally called for extensive revision, which has included the introduction of much new matter in the text and of the editor's baronetcy on the title-page.

Impotence in the Male

The psychic disorders of sexual function in the male. By WILHELM STEKEL, M.D. London: John Lane, The Bodley Head. 1940. 2 Vols. Pp. 679. 35*s*.

THROUGHOUT the whole of this interesting book runs the same message. Love inadequacy is increasing alarmingly amongst men, not because of any diminution in the strength of the sexual impulse but because of the diverse inhibitions with which love in a civilised man has to struggle. Civilised man has created for himself a far richer and more spiritual form of love than that known to the savage, and yet is suffering more and more from an inability to express it. A constant struggle is going on between his spinal cord and his brain, between his natural instincts and his higher faculties. The longing for love is on the increase, and the power to express it on the wain. The "art of making love has not kept pace with the enhanced development of spiritual love. On the contrary, it has declined and fallen into decay." Stekel puts the blame on the type of civilisation we have created for ourselves, in which men and women can express themselves only within certain narrow limits. Moreover, our intensive culture of the "will to power," in the form of financial success, leaves men with no time for other activities. Time is money and money has become of greater importance than love. It is not surprising therefore that half of civilised mankind is suffering from a conflict between sexual want and sexual ability, that the sexual athlete is a rarity and the sexual weakling in the ascendant. Dr. Stekel supports his thesis by case-sheets from his practice. These show not only the important part played by fear in the production of impotence, but the methods adopted by the psychologist to dispel it. The book is written in plain language that can be understood without a psychological upbringing. It can be recommended to all who are likely to meet with sexual difficulties in their practices.

THE LANCET

LONDON: SATURDAY, MARCH 23, 1940

EXAMINATION OF EVACUEES

THE Minister of Health has promised that if school-children have to be evacuated again he will ensure that they are medically examined before they reach their billets. Householders in the reception areas have not forgotten the disclosures of the last evacuation and this time will justly insist that children who are dirty in person or habits are housed elsewhere. The Minister has now set out his plans for medical examination in a circular to local authorities, whose duty it will be to put them into effect. The closing date for the registration of children who want to be evacuated is March 30, and the circular recommends that within three weeks of that date all the children registered should be examined by school medical officers in the evacuation areas and treatment instituted "for any condition which would render them unsuitable for billeting on private householders." Children whose condition is not altogether satisfactory are to be re-examined at intervals of not more than a month, and those who have had scabies or "severe" pediculosis at shorter intervals. Parents are to be told that they must keep their children clean and that the presence of scabies or impetigo will disqualify them from private billeting. So much for the preliminaries. Over and above these, local authorities must arrange for a further medical examination of the children in the evacuation area on the day that evacuation takes place or the preceding day and still another on their arrival in the reception area. The circular remarks that children going to distant places will arrive late in the evening, but urges that they should be distributed to their billets with a minimum of delay.

With the Ministry's preliminary plans no-one will quarrel. These are but a tightening up of the measures that have always been taken in schools to ensure cleanliness and freedom from minor infections. Last time, however, we were told that some at least of the nits and acari were there because the children had been on holiday before the evacuation took place. Regular supervision must therefore continue in the holidays and urgent steps should be taken to cleanse the homes from which verminous children come. But the arrangements made for inspection when evacuation comes seem to be framed with the sole purpose of meeting the letter of the Minister's promises. Under what conditions will the second evacuation take place? If Herr Hitler is considerate and the Ministry can give their promised 36 hours notice the scheme may work in a modified form, always presuming that raids do not come before April 20, when the preliminary examinations will be finished. But we are told that evacuation will be ordered "only if air-raids develop on a scale involving serious and continuing perils to civilian population" and it is at least possible that it will not be ordered until raids have begun. Local authorities are to arrange for the examination of 400 children an hour, which would need 20 doctors at the rate of one child per three minutes. Where are these to be found when raids are on? Certainly not in improvised minor-ailment clinics at railway stations in the evacuation areas. And what examination of any value is likely to be made by tired medical officers late at night with children and helpers clamouring to go to their billets?

If preliminary examination and treatment are carried out thoroughly all the most particular householder will ask is to be assured that the children are free from obvious pediculi and acute infections. This means that the child's head and body must be examined for parasites and skin eruptions, its throat for obvious inflammation, and its temperature must be taken. Such an examination will rule out all but the more obscure infections, and it can well be carried out by school nurses and health visitors, school-teachers, or indeed by any intelligent helper with a little instruction. These people will have the advantage of knowing the children they were examining—a great help in diagnosis—and if they travel with the children they can make their inspection either at the despatching or receiving end as seems convenient, but need not make it at both. And finally, this modified examination can be planned in detail in advance, with some certainty that it can be put into operation even under air-raid conditions.

MORE ABOUT SILICOSIS

SINCE HALDANE[1] and COLLIS[2] wrote their two classic summaries of existing knowledge of silicosis in 1914 and 1915 there has been an immense amount of both clinical and experimental work on the subject. The experimental investigations have mostly aimed at deciding, first what is the causative agent in disease-producing dust, and secondly what measures can be used to neutralise the harmful dust. The hardness and sharpness of the dust particles was the first reason suggested for the pathogenicity of industrial dust, and this mechanical theory survived for many years. But GARDNER'S[3] failure to produce silicotic lesions with carborundum dust, and KETTLE'S[4] convincing experiment in which iron-coated quartz failed to bring about the result obtained with the original quartz brought the theory of "microscopic trauma" into final disrepute. To take its place a chemical theory was evolved. This supposed that a soluble toxic substance, liberated from the dust particles, irritated the surrounding tissue to produce a fibrous

1. Haldane, J. S. Second Report of Royal Commission on Metalliferous Mines and Quarries, London, 1914.
2. Collis, E. L. *Pub. Hlth* 1915, **28**, 252: 29, **11**, 37.
3. Gardner, L. V. *Amer. Rev. Tuberc.* 1923, **7**, 344.
4. Kettle, E. H. *J. Path. Bact.* 1932, **35**, 395.

response. The toxic substance was thought to be silicic acid—dissolved SiO_2. Experimental support was given to the toxic theory by GYE and KETTLE,[5] who produced "almost a specific" lesion by subcutaneous injections of fine silica particles, and by GYE and PURDY[6] who found liver necrosis in animals which had been injected with colloidally dispersed silicic acid. Thus silicic acid came to be regarded as the immediate cause of the fibrosis in silicosis. But the question of what constituents of mineral dusts would produce the toxic substance, and hence cause the disease, remained in dispute. Industrial experience pointed to those dusts containing a large proportion of free silica—quartz and flint—as being the most dangerous, and most good experimental work with animals, such as that of GARDNER,[7] supported that conclusion. But a great body of other evidence has arisen, much of it seemingly contradictory, and much of it invalidated through faulty observation or improperly controlled experiments which has prevented universal agreement being reached as to which dusts are dangerous and which harmless.

In addition to supplying much of our clinical knowledge of silicosis and keeping it up to date with their periodic reports[8] the South African medical workers in the gold-mining district have contributed many of the most trustworthy experimental studies. In these they have the advantage of close coöperation with experts in many fields. Thus, with the coöperation of the Chamber of Mines, SIMSON and STRACHAN,[9] of the South African Institute of Medical Research, have secured authentic mineral specimens whose mineralogical and chemical characterisation must command confidence. These were sillimanite, orthoclase, muscovite, quartz, rutile, glass, a dust residue from human silicotic lung, and several mine dusts—all mineral materials of industrial interest whose silicosis-producing properties had hitherto been in doubt. The size distribution of the dust particles, which was estimated by PATTERSON, was very uniform in the several minerals, and corresponded closely with that found in the air breathed by mine workers.[10] Several small spaced doses of suspensions of the dusts were injected intravenously into rabbits, the dust being left to act on the tissue for periods up to 700 days. Most of the animals survived for more than a year. The tissues chiefly affected were those of the liver, spleen, lymph-nodes and bone-marrow—that is, those provided with an active reticulo-endothelial system related to abundant sinusoid tissue. Quartz, the mine dusts, and the lung residue were active. In all organs, particularly in the liver, there was a definite series of events culminating in dense fibrosis. The spleens were greatly enlarged, the lymph-glands were either "firm and rubber-like" or "densely hard as a result of hyaline fibrosis and calcification," and there was "discrete fibrous nodulation" of the bone-marrow. The inactive dusts—sillimanite, orthoclase, rutile, muscovite (of which sericite is a variety) and powdered glass—were seen as "accumulations of dust, apparently enclosed within a limiting membrane." There was no true chronic inflammatory reaction and no fibrosis. These experiments should mark the end of the suspicions attached to these minerals as causative agents in silicosis. They will confirm the current belief that quartz, flint, and other forms of free silica are the noxious elements of industrial dust, and SIMSON and STRACHAN maintain a close relation of their animal results to the human disease.

In the South African experiments the presence of coaldust with quartz in the proportion of 3 to 2 seems to have increased rather than prevented the action of silica. In Stockholm, NAESLUND[11] has been investigating in rabbits and guineapigs the possibility of preventing silicosis by specific dust inhalation, and the question of the risk of silicosis being increased by inhaling mixed dust. Coal seemed to have no influence on the effect of quartz. On the other hand, the effect was delayed by mixing quartz with cement when a milder silicosis resulted. The admixture of lime with quartz made little difference, so that if there is a neutralising agent for quartz in cement it does not appear to be the lime. There is a widespread belief that simultaneous inhalation of free silica and of alkali (e.g., soap powder) results in a rapidly developing silicosis. Various alkalis, with and without quartz, have been tried out in the Swedish experiments. The alkalis produced necrosis, œdema and cell proliferation in the lungs, and when they were mixed with quartz the same result was obtained. The effect in both cases could in fact have been directly due to the irritation of the alkali. The inhalation of alkaline dusts also rendered the animals very susceptible to infection, so that many of the examples of this type of "acute silicosis" recorded may have been cases of acute infection in alkali-damaged lungs.

We have already commented in these columns on the work of DENNY, ROBSON and IRWIN[12] of Toronto on the prevention of experimental silicosis with aluminium. This work rested on the finding that finely divided metallic aluminium would almost abolish the solubility of quartz. Simultaneous inhalation of quartz and aluminium dust by rabbits failed to produce the lesions seen when quartz alone was breathed. The close association of the aluminium with the quartz resulted in the latter becoming coated with a thin layer of hydrated aluminium hydroxide, which effectively prevented the quartz from going into solution. It was held that the development of the silicotic lesions could be prevented in this way. This startling claim was not without some support from industrial experience. It had been advo-

5. Gye, W. E. and Kettle, E. H. *Brit. J. exp. Path.* 1922, **3**, 241.
6. Gye, W. and Purdy, W. J. *Ibid*, 1924, **5**, 238.
7. Gardner, L. V. *J. indust. Hyg.* 1932, **14**, 18.
8. Irvine, L. G. Report on Miners' Phthisis Medical Bureau, Union of South Africa, 1939.
9. Simson, F. W. and Strachan, A. S. *Pub. S. Afr. Inst. med. Res.* 1940, **9**, 95.
10. Patterson, H. S. *Bull. Inst. Min. Met.* June, 1939.
11. Naeslund, C. *J. indust. Hyg.* 1940, **22**, 1.
12. Denny, J. J., Robson, W. D. and Irwin, D. A. *Canad. med. Ass. J.* 1937, **37**, 1; 1939, **40**, 213; see *Lancet*, 1937, **2**, 271; and 1939, **1**, 882.

cated by HALDANE [13] that the dust of certain shales could act as a natural antidote to the harmful dust of other rocks, and the belief had long been held that the practice of "stone-dusting" in coal-mines had certainly not increased the silicosis hazard, and may even have lessened it. Lately it has been shown by WHITEHOUSE [14] and KING [15] that these shale dusts exert the same depressing effect as aluminium, though to a lesser degree, on the solubility of quartz and flint. NAESLUND agrees with DENNY and his colleagues that metallic aluminium is the most effective material for depressing the solution of silica, but his success in preventing silicosis was not as complete as theirs; there are not yet grounds for introducing aluminium dust as a prophylactic means against silicosis. MIDDLETON'S [16] case of an aluminium-paint worker whose lungs contained lesions which could only be ascribed to the aluminium particles seems to lend support to this view. In the meantime, the results of clinical trials now being carried out in Canada will be awaited with interest.

TRAUMATIC SHOCK AND THE SUPRARENAL CORTEX

THERE is much to suggest that the suprarenal cortex plays a part in the defence of the body against the effects of injury. The patient with Addison's disease is notoriously unable to tolerate even mild surgical operations and the animal deprived of its suprarenal glands in a few days becomes highly susceptible to many different noxious agents. The histopathological features of the "alarm-reaction," which has been studied for several years by SELYE and his collaborators at Montreal, include hyperplasia of the suprarenal cortex, and it has lately been observed that patients after surgical operations excrete a considerable quantity of adrenal cortical substance in the urine. The condition of suprarenal cortical insufficiency closely resembles that of traumatic shock. Shock, however, develops within a few hours while the effects of complete extirpation of the suprarenals in mammals do not appear for several days. It is evident from experiments by SWINGLE and others [17] that the normal animal has reserves of cortical hormone which enable it to resist the milder degrees of trauma. In these experiments adrenalectomised dogs which were maintained in apparently normal health and activity by small doses of cortical hormone could be reduced to a condition of profound shock by trauma which had no deleterious action on normal dogs, and this shock was successfully treated with large doses of cortin.

We cannot assume that traumatic shock is caused by inhibition of the functional activity of the suprarenal cortex, but it is possible that certain changes which take place during traumatic shock call for supplies of cortical hormone in excess of the available stores. For example, the alterations in serum electrolytes and corpuscular concentration after experimental scalds [18] are almost identical with those in cortical insufficiency and these alterations are rapidly corrected by administration of the synthetic hormone desoxycorticosterone. These experiments suggest that the blood changes after scalds may be a result of altered permeability of cell membranes which have been damaged by excessive heat. There is, nevertheless, no good evidence that blood changes in themselves are responsible for the circulatory failure of tramatic shock. In fact the shock produced in SWINGLE'S experiments was not accompanied by electrolyte changes, corpuscular concentration or disturbance of water distribution, but was attributed rather to altered capillary tone and permeability.

VARANGOT [19] has urged, and Dr. POLLAK supports him in a letter on another page, that there is a clear case for the trial of cortical hormone in different forms of shock. Hitherto extensive trial has been handicapped by the expense of cortical extract, but the synthesis of desoxycorticosterone acetate by STEIGER and REICHSTEIN [20] has made such treatment a practical proposition. In this country the synthetic hormone has been tested by WILSON and STEWART [21] on a small scale in the secondary shock of burns and scalds and some other forms of circulatory failure. While they report some benefit in burn shock and intestinal obstruction the effects seem to be neither constant nor very dramatic. Certainly in profound shock the hormone is incapable by itself of raising the blood-pressure. Further investigation may, however, show that it is useful if only as an adjuvant to established methods of therapy.

AN EASTER APPEAL

THERE are in Great Britain and Northern Ireland 1095 organisations which come under the heading of voluntary hospitals. On Easter Sunday at 8.40 P.M. they will make a joint broadcast appeal, having chosen as their spokesman an officer of the merchant service who was lately one of their patients. The combined street collections which the London hospitals have been making for the past few years have shown the value of coördinated effort, and on Christmas Eve their first joint broadcast appeal was made. Its results were encouraging and the B.B.C. and the hospitals have now arranged to hold three combined broadcast appeals this year of which this Easter talk will be the second. Contributors may if they wish earmark their gifts for any particular hospital in which they are interested. The committee arranging the appeal may be addressed at 10, Old Jewry, London, E.C.2.

Dr. CHARLES SLATER, consulting bacteriologist to St. George's Hospital and formerly reader in bacteriology to the University of London, died at Tunbridge Wells on March 15 in his 84th year.

13. Haldane, J. S. *Trans. Inst. min. Eng.* 1917, **55**, 264 1931, **80**, 415.
14. Whitehouse, A. G. R. *J. indust. Hyg.* 1938, **20**, 556.
15. King, E. J. *Biochem. J.* 1938, **32**, 2283.
16. Middleton, E. L. *Bull. Inst. Min. Met.* April, 1939.
17. Swingle, W. W., Parkins, W. M., Taylor, A. R. and Hays, H. W. *Amer. J. Physiol.* 1938, **124**, 22.
18. Lowdon, A. G. R., McKail, R. A., Rae, S. L., Stewart, C. P. and Wilson, W. C. *J. Physiol.*, 1939, **96**, 27 P.
19. Varangot, J. *Pr. méd.* Jan. 31, 1940, p. 103.
20. Steiger, M. and Reichstein T. *Helv. chim. Acta*, 1937, **20**, 1164; *Ibid*, 1938, **21**, 171.
21. Wilson, W. C. and Stewart C. P. *Edinb. med. J.* 1939, **46**, (Transactions) 153.

ANNOTATIONS

ACUTE NEPHRITIS IN CHILDHOOD

ANYONE who studies the terminology of acute nephritis in childhood must be left with a feeling of bewilderment—W. W. Payne and R. S. Illingworth[1] give a list of eighteen different terminological varieties—and with all this differentiation there is no evidence of increased clarification. Payne and Illingworth have tried to clear away a lot of unnecessary classification and they attack in particular the diagnosis of acute focal nephritis. The first detailed description of this type is usually attributed to Volhard and Fahr, who defined it as a symptomless hæmaturia arising at the height of an acute infection, without œdema, nitrogen retention, hypertension or reduction in urinary volume, and with a uniformly good prognosis. This conception has been generally accepted by pædiatricians in this country, but Payne began to have doubts about the simplicity of the clinical syndrome when he found that nitrogen retention was often present. With Illingworth he has searched the records of the Hospital for Sick Children, Great Ormond Street, and in their paper they discuss 301 cases of acute nephritis seen there. It soon became clear that many cases diagnosed as acute focal nephritis were accompanied by symptoms as severe as in those called acute diffuse nephritis. Thus vomiting, headache, frequency of micturition and abdominal pain were as common in cases without definite œdema as in those with œdema, among children admitted during the acute stage. This seems to dispose of the "symptomless hæmaturia" definition of acute focal nephritis, but the matter is still further elucidated by the demonstration that, accepting definite œdema as evidence of diffuse kidney damage, a high degree of nitrogen retention was rather less frequent in cases of acute nephritis with œdema than in those without. It is true that in many children with the simplest forms of acute nephritis the blood-nitrogen figures fall rapidly and after a few days are almost normal. It may be this which has led many authorities to speak of the absence of nitrogen retention in one form of acute nephritis. It is perhaps of some significance that the commonest symptom associated with high degrees of nitrogen retention was vomiting, and it would be fair to assume that Payne and Illingworth satisfied themselves that the kidney lesion and not the vomiting is the main cause for the alteration in the blood chemistry. The whole value of the clinical diagnosis of acute focal nephritis lay in its good prognosis, but even this is demolished by Payne and Illingworth. Classifying cases into those with no œdema, those with no œdema other than puffiness of the eyelids, and those with definite œdema, they found the prognosis in the three groups was equally serious, the majority being not healed but in a latent stage of disease when re-examined from one to twelve years after the acute attack. Essential in the diagnosis of this latent stage of nephritis is a careful microscopical examination of a centrifuged urinary deposit. It is suggested that the uniformly good prognosis hitherto given for cases called acute focal nephritis may partly be due to a more superficial examination of the urine. Payne and Illingworth conclude that acute focal nephritis is not a clinical entity since there are no criteria of any value in diagnosing it. If their views are accepted there seems to be no way of establishing during an attack of acute nephritis in childhood what is likely to happen.

1. *Quart. J. Med.* January, 1940, p. 37.

PSYCHOBIOLOGY

AMONG the criteria of fame, the creation of an adjective from one's surname should rank high. Pauline purity and Shavian wit are not only memorials but useful descriptive epithets for which any language may be grateful. In psychology, the adjectives Freudian, Jungian, and Adlerian, however, owe their persistence as much to the nebulousness of the ideas they are intended to convey as to the fame of their parents. The same cannot be said of Meyerian. Though the words of Adolf Meyer himself are not always easy to follow—they often appear as German translated into American—he has wisely trained up a generation of psychiatrists who not only know what he is talking about but can translate it into everyday language. One of these is Dr. Wendell Muncie, and in his new book[1] he has set out Meyerian psychobiology and psychiatry in such a way that anyone with an I.Q. above 120 should have no difficulty in following him.

Psychobiology is based on the conception that an accurate and complete record of the events in a person's life from birth on enables one to understand behaviour seen in any particular cross-section. In other words, it relies on what we more humbly call the patient's personal history. What are considered the important events are put down chronologically on a somewhat illogically constructed torpedo-shaped chart, and the result is grandly known as a "psychobiogram." From the psychobiogram of Mrs. A. G. we learn she was an obedient child when 3½, had measles at 4, learnt where babies come from at 15, developed endogenous depression at 37, and so on. The value of the method is its objectivity. Facts are recorded free from fanciful interpretations. Its great disadvantage is its neglect of constitution as shown by the family history. Parents and relatives are dismissed in two or three lines. The unbiased psychiatrist recognises that if the child is father to the man, so equally is the father father to the child.

The second criticism which Meyerian psychobiology and psychiatry must face is its outlandish terminology. A glossary may help the uninitiated.

MEYERIAN	ENGLISH
Oligergasias	Mental defect
Minor pathergasias	Minor psychoses—or neuroses
Major reactions or holergasias	Major psychoses—or psychoses proper
Merergasias	Apparently the same as the minor pathergasias
Thymergasias	Affective reaction types
Para-reactions	Paranoid and schizophrenic states
Parergasias	Schizophrenic states
Dysergasias	Confusional states
Anergasias	Irreversible organic psychoses

The embryo psychobiologist is advised to start by constructing a psychobiogram of himself and of two of his colleagues. While it is no doubt excellent for students to do their own blood-sugars and blood-ureas, the advisability of prolonged introspection is another matter. It is not necessary to have lymphadenoma to understand its pathology. A training in objective unemotional observation is enough. Nevertheless psychobiology is an eminently sane, scientific, and valuable approach to psychiatry. Occupation therapy, hydrotherapy, the rational use of drugs, and

1. Psychobiology and Psychiatry. A textbook of normal and abnormal human behaviour. By Wendell Muncie, M.D., associate professor of psychiatry, Johns Hopkins University. London: Henry Kimpton. 1939. Pp. 739. 40s.

treatment by explanation, exhortation, and personal contact all find a balanced place in the scheme. It approaches the treatment of mental illness with a hopefulness which is in welcome contrast to our English therapeutic nihilism.

CLEARANCE OF SODIUM EVIPAN

THE safety of continuous intravenous administration of a drug such as sodium evipan depends on the way in which it is rendered inactive in the body. The term "clearance" is used to imply reduction in the amount of active drug in the body, and in the experiments undertaken there has been no attempt to determine whether the drug is broken down or is merely deviated by fixation by tissues other than the brain. Clearance may be exponential, a fixed proportion of drug being removed per unit of time, or constant, a fixed quantity of drug being removed per unit of time. With drugs cleared in an exponential manner cumulation rises to a maximum, after which there is no further increase; with those cleared in the second way there is no limit to cumulation, which can go on until death is produced. Das and Raventós [1] of Edinburgh examined the clearance of sodium evipan in rabbits, mice and monkeys (*Macacus rhesus*). Two experimental methods were used. In the first a large initial dose was given intravenously and the rate of infusion to maintain a constant state of depression was then determined. In the second the times needed for recovery after different doses were observed. The results of the first method indicate that in rabbits the rate of clearance is about 1/125 of the amount present in the body per minute, in mice 1/35 per minute and in monkeys 1/30 per minute. With rabbits the results of the second method agreed with the first, the rate of clearance being 1/22 per minute. With mice the second method gave the much slower rate of destruction of 1/110 per minute. Das and Raventós did not experiment with monkeys by the second method, but they quote the results of Storm, who found by this method that the rate of clearance was 1/140 per minute. The reason for discrepancy between the two methods is not known. All the experiments indicate that the clearance of sodium evipan is approximately exponential—i.e., the amount cleared per minute is proportional to the amount injected. This evidence that sodium evipan is cleared by the safer of the two ways of clearance bears out the clinical experience that it is safe to administer the drug by continuous intravenous infusion.

CURARE IN CONVULSION THERAPY

VARIOUS measures such as hyperextension of the spine and insulin premedication have been adopted with a view to reducing the risk of vertebral fractures in the convulsion treatment of mental disorders, and we have already mentioned in these columns the work of Bennett of Omaha on spinal anæsthesia in this connexion.[2] Bennett [3] now suggests the use of curare in combination with the convulsant drug on the lines proposed by Cole,[4] Ranyard West [5] and others before them in the treatment of tetanus. He was led by his results in the treatment with curare of spastic paralysis in children to apply that drug to lessening the severity of the muscular contractions which follow the injection of Metrazol. The varying composition of curare makes it necessary to estimate the effective principle in each fresh supply. This is done by determining the minimal lethal dose per kilogramme in mice. The problem of producing a safe commercial preparation is being undertaken by Prof. A. R. McIntyre of Nebraska and a safe commercial preparation should soon be available. The drug is injected intravenously or intramuscularly, and the physiological effects begin immediately after intravenous and fifteen minutes after intramuscular injection. The patient develops ptosis, nystagmus and strabismus with diplopia, weakness of the neck muscles, loss of facial expression, slow and hesitant speech and weakness of the throat and jaw muscles. Next the spinal muscles are affected and lastly those of the arms and legs. When the patient can no longer raise his head the convulsant drug is given; the convulsion then comes on immediately but with little tonic or clonic contraction. The only special precautions needed are to support the patient's head and to insert a tongue gag. Bennett advises slightly larger doses of metrazol than usual, but he has not found that curare lessens the effectiveness of the treatment. The requisite dose of curare is between a quarter and a half of the calculated human lethal dose. The only complication noted so far has been a transient urticaria in some cases, but Bennett advises that adrenaline and prostigmin should be at hand to be given in conjunction with artificial respiration if there are signs of respiratory failure. In tetanus Ranyard West found that with the alkaloid curarine there was a real danger from respiratory spasm and Cole has lately noted [6] that he has abandoned curare in that disease. Until a large series of cases has proved that the administration of relatively large doses of curare does not mean that one risk is substituted for another it is questionable whether the practice should be widely followed. The incidence of fractures in ordinary Cardiazol treatment is still debated and their importance is as yet uncertain. The experience of psychiatrists who have used convulsion treatment with success and the recent finding of symptomless spinal fractures in epileptics suggest that it is at least as urgent to inquire into the significance of these injuries as to attempt drastic measures of prevention.

CHOICE OF A STETHOSCOPE

MOST of us choose our stethoscope on the advice of the registrar or even of the maker and stick to it through life. At that stage in our evolution we have no way of judging an instrument for ourselves—the rustling of the hairs on the chest drowns all else—and later on we rightly refuse to change, for by then we have laid down that standard of normality which is essential for successful auscultation. Nevertheless, there is much to be said for an efficient instrument and it was high time that someone inquired into the acoustic properties of the multitude of types on sale. This has now been done by Johnston and Kline [7] of the University of Michigan. They produced artificial heart-sounds by means of a telephone receiver driven by a variable-frequency oscillator. The receiver was placed inside the heart of a cadaver through an abdomino-diaphragmatic incision, leaving the chest-wall intact. The chest-piece of the stethoscope under test was then clamped to the præcordium and the ear-pieces were connected to a condenser microphone with an output meter. Twenty-four different chest-pieces were compared as well as six kinds of rubber tubing of different lengths. The results were expressed in decibels and compared with those of a bell-type stethoscope which was adopted

1. Das, S. C. and Raventós, J. *Quart. J. exp. Physiol.* 1939, **29**, 343.
2. See *Lancet*, Feb. 10, 1940, p. 275.
3. Bennett, A. E. *J. Amer. med. Ass.* Jan. 27, 1940, p. 322.
4. Cole, L. *Lancet*, 1934, **2**, 475.
5. West, R. *Ibid*, 1936, **1**, 12.
6. Cole, *Ibid*, Jan. 27, 1940, p. 164.
7. Johnston, F. D. and Kline, E. M. *Arch. intern. Med.* February, 1940, p. 328.

as an arbitrary standard. There were a few surprises. The first was that the length of the tubing made little difference, in fact a length of 70 cm. was rather more efficient than one of 15 cm. until the higher frequencies were reached. The stiffness of the rubber was also immaterial, though a small bore was an advantage. The chest-pieces varied considerably in efficiency. As might be expected most sound was received with bells of the largest diameters and the shallowest air-chambers, but a curious finding was that the addition of a rubber nipple or sheath added appreciably to their efficiency. The Bowles type of chest-pieces showed up well, whereas the performance of those with a small dome above the bell was poor. Johnston and Kline advise a bell with as large an aperture as possible—say 3 cm.—and a shallow air-chamber—say 3–5 mm. in depth. The passage leading up from the air-chamber should be not more than 3 mm. in diameter and should be of the same bore as the rubber tubing. A rubber nipple or sheath adds to the comfort of the patient and makes it easier to ensure accurate apposition with the chest-wall, and if these also add to the efficiency of the chest-piece they are clearly to be recommended. There are other considerations besides mere loudness which have to be thought of in a stethoscope—freedom from distortion is at least as important, and more particularly in babies accurate localisation of a sound is impossible with a large chest-piece. Nevertheless, this inquiry will give the prospective purchaser some firm grounds for his selection.

INFECTIVE HEPATITIS AND CATARRHAL JAUNDICE

IT is now accepted that there are two forms of mild jaundice in this country, one due to a catarrh of the common bile-duct associated with duodenitis, the other to hepatitis. Findlay[1] doubts whether the Gallipoli epidemic was secondary to duodenitis and believes that infective hepatitis is the cause of all epidemics which are not leptospiral, basing his opinion on pathological evidence obtained from several independent sources. It has been thought for many years that infective hepatitis is probably caused by a filtrable virus, and during the last few years new evidence in support of this has accumulated. On more than one occasion laboratory workers have contracted the disease when working with the sera of infected persons. Jaundice has developed both in England and in South America after immunisation against yellow fever. Over a period of two years 96 cases occurred two to three months after inoculation and in one fatal case subacute necrosis of the liver was found. Convincing proof was obtained that the jaundice was not caused by the virus of yellow fever. The agent causing the hepatitis could be propagated in an artificial medium, it produced no visible growth, was invisible with the highest powers of the microscope, and passed freely through Seitz E.K. filters. Clinically it resembled infective jaundice, but there was no evidence that it could be communicated to contacts. The first proof that post-inoculation jaundice could give rise to infective hepatitis in contacts was obtained from the use of pooled convalescent measles serum. In one institution 7 children became jaundiced between ten and twelve weeks after inoculation and 3 died of acute necrosis of the liver. Two months later two contacts, who had not been inoculated, developed infective hepatitis. In his report for 1937 MacNalty said that 92 to 100 persons developed the disease from this batch of pooled serum. More recently jaundice has followed the injection of another bacteriologically sterile batch of pooled measles-immune serum. As a result of this experience Findlay concludes that it is advisable to keep serum at least a month before using it.

Infective jaundice is widely distributed in Europe, America and the Near East, but is rare in India, and is most common in partially closed communities, such as schools, barracks and hospitals. Protracted epidemics have been reported in outpatient departments. For example, Graham described one in 1938 in a diabetic clinic, and many others have arisen in treatment centres for venereal diseases affecting both patients and attendants. Infective hepatitis is spread from one person to another by droplet infection. The suggestion made in Denmark that it is identical with porcine hepatitis and that it can be contracted by eating infected pork has not been confirmed. Even if true, porcine hepatitis is so rare in this country that it cannot play an important part in the spread of the disease. The incubation period of infective hepatitis is a month or more and the infective period lasts through the pre-icteric stage of one to ten days and for the first three to five after the appearance of the jaundice. It can be distinguished from leptospiral jaundice by the absence of high fever and polymorphonuclear leucocytosis, by failure to isolate the leptospira or to infect guineapigs, and by the absence of agglutinins in the blood.

In conclusion Findlay says that the danger of liver insufficiency and the occasional deaths from acute or subacute necrosis of the liver make it desirable to treat all cases of infective hepatitis with glucose, and that if signs of liver insufficiency appear isotonic (5 per cent.) glucose should be given intravenously. The amount should not exceed 500 c.cm. in 24 hours and 5 to 10 units of insulin should be given in the same period to aid its absorption.

1. Findlay, G. M. *Jour. R. Army med. Cps*, February, 1940, p. 72.

ESTIMATION OF BLOOD IN SMALL QUANTITIES

A NEW reagent prepared from the oxidation-reduction indicator employed in the chemical estimation of vitamin C can be used according to Barrett[1] for the detection of blood in pathological specimens and for the estimation of hæmoglobin in a very small sample of blood, such as the suspension of red cells left after a blood-count. The indicator is 2 : 6 dichlorophenol indophenol, which is commonly encountered in the oxidised form and is red in acid solution. By reduction with stannous chloride the colourless form is obtained. This is used in a buffered acid solution and is not oxidised by 0·2 per cent. alcoholic hydrogen peroxide. The basis of the test for blood is that if hæmoglobin is present in the solution the hydrogen peroxide is able to oxidise the reduced indicator so that the solution becomes red. The colour does not fade or change its tint on standing, and the intensity is taken, under suitable conditions, as a measure of the quantity of hæmoglobin present.

In applying the test to pathological specimens, the blood-pigment is extracted with ether from the previously boiled and acidified specimen. In this way the effect of interfering substances is eliminated and the action of reducing substances such as ascorbic acid is prevented. Barrett[2] had previously shown that these reducing bodies prevent the detection of small amounts of blood by the commonly employed chemical tests. Using this technique the 2 : 6 dichlorophenol indophenol test is said to detect blood in a dilution of 1 in 50,000.

A very small sample of blood, 0·00025 c.cm. or more, is required for the quantitative estimation of

1. Barrett, J. F., *Brit. J. exp. Path.* Feb. 1940, p. 22.
2. *Lancet*, 1936, **2**, 1214.

hæmoglobin. The specimen is diluted 2000 times with water and a measured quantity is treated with alcoholic hydrogen peroxide and the reduced indicator solution. The maximum intensity of red colour is produced after standing for an hour. This colour is measured in a colorimeter by comparison with a standard solution of hæmoglobin which is treated with the reagents at the same time as the unknown. The solution of hæmoglobin is prepared from blood which has been standardised by measurement of its oxygen capacity, and is preserved in dilute alcoholic solution. Good agreement was obtained between this method and a colorimetric alkaline hæmatin method when applied to samples of human blood.

THE STOMACH AND THE HEART

ATTACKS of angina pectoris are more easily provoked by exertion soon after meals than before meals. The necessity for avoiding digestive disturbances is also recognised in such cases, as is the fact that attacks of angina not uncommonly end with the eructation of wind. That there is some association between the digestive apparatus and angina is clear, but little is known about the underlying mechanism; it is not even certain whether gastric flatulence is cause or effect. In congestive heart failure the anorexia, nausea and vomiting and flatulence no doubt arise from congestion of the gastric and intestinal mucosa. Morrison and Swalm [1] have now investigated the effect of œsophageal and gastric distension in four patients—two with angina pectoris, one with hypertensive heart disease and one with arteriosclerotic heart disease. Their apparatus consisted of a toy balloon attached to a stomach-tube and this was guided fluoroscopically into the stomach and into the upper, middle and lower thirds of the œsophagus. In both patients with angina pectoris typical attacks of pain came on when the tension in the balloon rose to 40–60 mm. of mercury whether it was in the œsophagus or in the stomach. In one of these no electrocardiographic changes were recorded during the attacks, but the other showed cardiac arrest, probably due to sinus block, and changes in the RT segment on gastric distension, normal rhythm being restored immediately the distension was relieved. The other two patients complained of severe epigastric distress and substernal fullness, and in the one with hypertensive heart disease there were definite changes in the RT segment. Morrison and Swalm suggest that the anginal attacks were evoked through the mediation of the vagus. If this is so atropine should help to relieve the pain of angina pectoris. Among the latest contributions to the perennial discussion of the innervation of the coronary vessels is a paper by Katz and Jochim [2] in which they conclude that in the dog the vagi carry only cholinergic coronary vasodilator fibres which are tonically active, no evidence being obtained of cholinergic coronary vasoconstrictor fibres. On the other hand they found the tonic action of the sympathetic nerves to be dominantly vasoconstrictive. Fainting and cardiac arrest are rare in angina pectoris, and while this last observation may explain some of the sudden deaths in anginal patients, their occurrence in one of Morrison and Swalm's two cases makes it difficult to accept their hypothesis as an explanation of the majority of cases of angina pectoris.

The investigations of Banting and his colleagues [3 4 5] in Toronto point to a definite relation between vagal activity and myocardial and gastric lesions. By repeated intravenous injections of acetylcholine and by repeated stimulation of the vagi in dogs they have produced changes in the coronary vessels, including thrombosis, and infarction and fibrosis of the myocardium, while comparable changes were produced in the stomach which resulted in vomiting, melæna, diarrhœa and occasionally hæmatemesis. In view of these findings it would be interesting to know what is the effect of the acetylcholine derivatives, such as Mecholyl, in angina pectoris. Normal people given mecholyl occasionally complain of a sensation of compression across the front of the chest, but the question is complicated by the indirect stimulation of the suprarenals which the injection of mecholyl probably produces in man.

1. Morrison, L. M. and Swalm, W. A. *J. Amer. med. Ass.* Jan. 20, 1940, p. 217.
2. Katz, L. N. and Jochim, K. *Amer. J. Physiol.* 1939, **126**, 395.
3. Hall, G. E., Ettinger, G. H. and Banting, F. G. *Canad. med. Ass. J.* 1936, **34**, 9.
4. Manning, G. W., Hall, G. E. and Banting, *Ibid*, 1937, **37**, 314.
5. Banting and Hall, *Trans. Ass. Amer. Phys.* 1937, **52**, 204.

THROMBOSIS OF THE SUPERIOR VENA CAVA

OBSTRUCTION to the superior vena cava is by no means common, and thrombosis as a cause of the obstruction is a distinct rarity, Ochsner and Dixon [1] in 1936 only being able to find 120 cases recorded, some of which were doubtful. Buzzard [2] describes a case in a man of 38, whose history included acute rheumatism as a child, lobar pneumonia at the age of 35 and a small thrombosis of the right leg below the knee a year later. He was admitted to hospital complaining that for a month he had had a bursting sensation in his head made worse by stooping. He had also had a small hæmoptysis a fortnight before admission. He showed the classical signs of obstruction to the superior vena cava, but no evidence could be found of heart disease, pulmonary tuberculosis or intrathoracic neoplasm. The blood Wassermann and Kahn reactions were negative. Radiologically a slight widening of the mediastinal shadow, thought to be due to a congested vena cava, was detected. Thoracotomy was ultimately performed and this revealed a thickened pleura with engorged apical adhesions which were broken down. The superior vena cava could then be felt as a hard band. No constricting bands and no mediastinal tumour were found. Although the operation was merely exploratory the patient steadily improved after it, and four months later the signs of obstruction were less evident and his capacity for exercise was decidedly greater than before the operation. In discussing the ætiology of his case Buzzard considers two possibilities—a recurrent thrombophlebitis, and mediastinitis resulting from lobar pneumonia. In support of the former he suggests that the hæmoptysis may have been due to a pulmonary thrombosis, a not uncommon complication of recurrent thrombophlebitis. Ochsner and Dixon found that of their cases 29 per cent. were associated with external pressure, 23 per cent. with mediastinitis, and 36 per cent. with phlebitis. They reported a mortality of 76 per cent., but since anything up to 80 per cent. of cases of obstruction to the superior vena cava are associated with aneurysm of the aorta or carcinoma this figure had no bearing on the outlook in Buzzard's case, where the main risks seem to be further thromboses or dislodgment of clot from the thrombosed vessel. It will be interesting to see what the man's future story will be.

At a meeting of the Royal College of Physicians of London held on Monday last Sir ROBERT HUTCHISON was re-elected president.

1. Ochsner, A. and Dixon, J. L. *J. Thorac. Surg.* 1936, **5**, 641.
2. Buzzard, E. M. *Brit. J. Tuberc.* January, 1940, p. 39.

CONTROL OF THE COMMON FEVERS

SCARLET FEVER

Reviewed by Dr. JOHN E. GORDON, *professor of preventive medicine and epidemiology, Harvard University, Boston, Mass*

(*Concluded from* p. 513)

SPECIFIC PREVENTION

THE unsatisfactory results obtained from general measures intended to limit the spread of the infective agent naturally lead to serious consideration of methods for specific prevention.

Erythrogenic toxin and the Dick test.—A valuable adjunct to a programme of specific immunisation is a method for sorting out susceptibles from immunes; the Dick test does this for clinically recognisable scarlet fever. The method has certain anomalies and limitations characteristic of other biological tests for immunity. These have been discussed at length by Fraser (1937), McGibbon (1934), Anderson (1935), and many others. The difficulties are centred on the allergic reactions caused by constituents of the test material other than toxin and the qualitative differences in erythrogenic toxin produced by some strains. The studies of Ando, Kurauchi, and Nishimura (1930) showed that crude filtrates from strains producing erythrogenic toxin contained two substances capable of producing skin reactions. One is an alcohol-insoluble fraction which is relatively heat-labile, produces the Dick reaction, combines readily with streptococcus antitoxin, and produces the symptoms of scarlet fever other than those associated with inflammation and sore-throat; this is the erythrogenic toxin. The second fraction is insoluble in both alcohol and acetic acid, is heat-stable, has no combining power with antitoxin, and produces both local and general reactions in adult persons which, however, do not resemble scarlet fever; it is apparently identical with the nucleoprotein obtained by extraction of the washed bacteria. Injected into the skin, it leads to a manifestation of sensitisation to this bacterial protein without relation to susceptibility to scarlet fever. Veldee (1937) compares the erythrogenic toxin with the toxin of the diphtheria bacillus, where susceptibility depends on absence or low concentration of circulating antitoxin, and he brings out that susceptibility decreases with age and the extent of exposure to streptococcal infection. Sensitivity to the second fraction increases with age and the extent of exposure. Not uncommonly there is sensitivity to both fractions in the same person. The second fraction may be a source of error in the Dick test as applied in the field.

It has been brought out that the erythrogenic toxins produced by most strains of hæmolytic streptococci are essentially similar. However, heterogenicity exists (Trask and Blake 1933), a fact which is recognised in commercial preparation of Dick-testing material, the toxins from several strains being considered essential to a satisfactory product. Three groups of toxins have been distinguished by Fraser (1937), and antitoxin prepared from the prevailing group does not neutralise the toxins of some 10 per cent. of scarlet-fever strains. A Dick-negative person exposed to such strains might well contract the disease. With these two reservations, the level of antitoxin demonstrated with the ordinary test material has been found reliable and in practice is a sensitive measure of resistance to clinically recognisable scarlet fever. This is equally true in regions where the prevailing infection is highly toxic and in those where it is mild. A negative test, however, gives no indication of ability to resist infection with β-hæmolytic streptococci of group A; it does assure with relative certainty the unlikelihood of contracting manifest scarlet fever.

Immunisation with erythrogenic toxin.—The method for active immunisation originated by Dick and Dick (1924b) has repeatedly demonstrated its ability to protect against recognisable scarlet fever, when used among student nurses, for children in institutions, and for susceptible persons in the general population. The recommended course of five injections of toxin, beginning with 500 skin-test doses and increasing to a final 80,000 skin-test doses, leads to immunity to the toxin in about 90 per cent. of susceptible persons, as judged by a change of the Dick test from positive to negative. The antibody response is in general somewhat more rapid than that which follows active immunisation against diphtheria.

There are two reasons for the rather limited use to which this method has been put: (1) the administrative difficulties associated with a series of five injections and the clinical reactions that follow; and (2) the often-expressed doubt about just what is accomplished, both as regards broad control of the infective agent in the community and as regards the individual and his resistance to hæmolytic streptococcal disease. The first objection is justified. For use in large groups, in public clinics, a procedure which requires a series of five injections is administratively difficult under the best of conditions. It becomes more so when the reactions that follow are as severe and as common as the experience of many observers indicates that they are with this method. Veldee (1933) has proposed a method of immunisation with hæmolytic streptococcus toxin modified by formalin, in a series of three injections. Anderson (1935) found this antigen to be remarkably free from undesirable after-effects, but the proportion of persons developing antitoxic immunity was relatively low. Through improved methods of purifying the native toxin Veldee (1938) obtained a more active antigen having essentially the same desirable freedom from reactions. Criticism has also been made that the protection is of short duration; but the engendered resistance appears to last for years and may well be reinforced and maintained by subsequent mild or subclinical infections. The second contention is more difficult to evaluate, largely because factual evidence is limited and contradictory. The statement has often been made that, in protecting against the rash of scarlet fever, immunisation would be followed by an increase in the number of sore-throats of streptococcal origin—in reality scarlatinal angina—to such an extent as to compensate for the cases of recognisable scarlet fever that were eliminated. About the only available evidence is from studies on immunisation of nurses in hospitals for communicable disease. Kinloch, Smith, and Taylor (1927) and Hoyne (1938) assert that this does take place; Benson (1928) and Place (1938) that it does not, and that immunisation with erythrogenic toxin is associated with a decrease in sore-throats. Scarlatinal angina is, theoretically, just as active a source of infection as are cases with rash—perhaps more so, because the danger is not appreciated, and no isolation is imposed. If appreciable numbers of such cases exist, rather complete immunisation of a community would be required to eliminate recognisable forms of scarlet fever.

The method of active immunisation, as it now exists, can be applied to advantage for protection of nurses and others responsible for the care of

patients with scarlet fever. It has a place in the management of institutions for children where exposure is frequent and likely and may often be extensive. It can be recommended for protection of individuals when indicated or desired for special reasons. In those limited regions where scarlet fever is a severe toxic disease a general programme is indicated. In Rumania the product used (Turcu and Rusu 1935) had little effect on morbidity, but the number of deaths among those inoculated was a quarter that of a similar group serving as controls. Where the disease exists in a mild form, present methods are not endorsed as a general public-health measure. The administrative difficulties, the attendant reactions, and the too indefinite knowledge of what actually is accomplished in eliminating infection from a community are the basis for this opinion; which further rests on the conviction that, despite inherent objectionable features, a preventive method may well be endorsed where the danger is particularly great, but not advocated in less hazardous and ordinary circumstances.

PREVENTIVE MEASURES FOR FAMILIAL AND OTHER IMMEDIATE CONTACTS

Young children are most susceptible to scarlet fever, but the total cases among familial contacts are few, compared with the number that follow diseases like measles and chickenpox. A special field survey showed rates of 17 per cent. for children aged less than 15, and 7 per cent. for contacts of all ages. These figures are probably close to fact. They are appreciably greater than those obtained in the course of ordinary notification, which are often closer to half these values. In institutions half of the susceptibles may be involved. Much depends on the age of the persons concerned, the extent to which their environment has led to latent immunisation, and the degree and duration of exposure.

Quarantine.—If a patient with scarlet fever is isolated at home, it is of advantage to remove susceptible children to the home of adult relations or of friends who have no children. When this is done, the exposed children must be kept out of school, but no other restrictions are necessary, except perhaps a warning card. If the children do not develop symptoms of scarlet fever within a week, they may be permitted to return to school. If the patient is removed to the hospital, the children may remain at home under the same conditions. Where both patient and contacts remain at home, quarantine of unaffected children under 15 must continue through the period of isolation. What appears to be sensible administration is the developing tendency to permit greater liberty to adult familial contacts, irrespective of whether the patient is isolated at home or in hospital. The Detroit regulations already cited permit adult familial contacts to go and come from the quarantine area, provided their work does not bring them in contact with food for public consumption or with the care of children. For the purpose of this regulation an adult contact is defined as one who is not attending the patient, who is 15 or older, and who must leave the premises for some useful purpose. Secondary school-children, college students, teachers, and adult attendants of the same grade are given permits to return to school under the same conditions that govern other adult members of the household. Instructions are given to the persons receiving such permits to avoid caring for or associating with the patient, and they must not enter the isolation area. They are also instructed, if they develop a sore-throat or fever, to return home and to call their physician.

School and institutional outbreaks.—Children in schools or institutions who have been exposed to cases of scarlet fever should be examined carefully each day during the following week. If there is any indication of scarlet fever or sore-throat, they should be promptly excluded until proved free from scarlet fever. When this method does not control the situation, Dick-testing of all contacts is useful in finding those who are susceptible. The susceptible group should then be segregated or immunised. Active immunisation by injection of toxin can be used, or one of the methods for passive protection. Schools are advisedly not closed where daily observation of children by a physician or nurse can be provided.

Passive protection.—Passive immunisation is used where need exists for prompt protection against known exposure, particularly for persons suffering from other illnesses, poor nutrition, or other inadequacies of health. In general, it is limited to circumstances where repeated exposure is unlikely. With almost no exceptions, hæmolytic streptococcus antitoxin (Dick and Dick 1924c) will protect against scarlet fever for two to three weeks. The method is not much used, because the serum reactions that commonly follow are frequently worse than the prevailing type of scarlet fever, and because of the frequent and permanent sensitisation to horse serum. Some physicians wait for the first indication of illness in a person known to have been exposed and then give a full therapeutic dose.

Human serum obtained from the blood of persons recently recovered from scarlet fever has been used for passive protection. Individual preparations vary in efficiency because of lack of adequate methods for standardisation, and the most desirable dose for different age-groups has not been wholly determined. Meader (1930) reports an 80 per cent. reduction in secondary cases among children exposed to infection in the family, compared with a second group equally at risk and remaining untreated. The serum was used in amounts of 7·5 c.cm. Experience indicates that perhaps double that amount is necessary for protection of susceptible adults. In the cities of the United States facilities have been provided for preparation and distribution of the serum for the purpose of limiting outbreaks in institutions where the presence of the disease was recognised in its beginning. In private practice good results have been claimed, as would be expected from a disease with an attack-rate no higher than that of scarlet fever. Elsewhere the method seems to have dropped into disuse. McKhann and Chu (1933) report satisfactory results from the use of placental extracts.

CASE-MORTALITY AND SPECIFIC TREATMENT

Although the number of people who contract scarlet fever now is about the same as it was fifty years ago, the number who die is much less. Death-rates in many countries are a twenty-fifth of what they were then. A good deal of the change is due to an improved level of general health, a factor difficult to measure but undoubtedly real. The most important influence is the existing favourable state of equilibrium between host and parasite. The development of methods for specific treatment and the generally better medical management of those who become ill have also contributed to a lower case-mortality. Hæmolytic streptococcus antitoxin (Dick and Dick 1924c) has been useful for those more seriously ill, although rarely used for all patients because of the prevailing mild type of infection. This experience has been duplicated in countries where truly toxic scarlet fever exists. Most clinicians find human convalescent serum (Top

and Young 1939) more useful in septic forms of the disease. Immunotransfusion (Gordon 1933) is the method of choice in exaggerated forms of acute septic infection and in the late sepsis associated with complications.

SUMMARY AND CONCLUSIONS

The principles involved in a programme for control of scarlet fever are now much better defined. This has come about as a result of the important biological relations established between hæmolytic streptococci of this and other diseases. The need now is for quantitative epidemiological information that will show the place of scarlet fever in the general scheme of all disease of man due to β-hæmolytic streptococci.

Probably no epidemic of scarlet fever is ever wholly composed of classical cases with rash. Depending on the immunity status of the community and the characteristics of the particular strain, a varying proportion of those affected will have only sore-throat or acute infection of the upper respiratory tract. Strains of hæmolytic streptococci without ability to form erythrogenic toxin cause outbreaks in which the only clinical manifestation is sore-throat. An epidemic due to a strain with low-grade toxigenic activity will probably be of mixed character, with angina predominating, but some instances of recognisable scarlet fever certain to develop. Irrespective of its frequency, if recognisable scarlet fever is seen in the course of a sharp outbreak of streptococcal disease, modified isolation should be practised for persons with angina or with infection of the upper respiratory tract, at least through the clinically active stage.

The advisable procedure for sporadic infections of the same clinical nature is not so well indicated. If known to follow exposure to patients with scarlet fever, they should be treated like scarlet fever. Appearing unrelated, they must ordinarily be considered as simple streptococcal infections. This interpretation rests on necessity, with full realisation that such sporadic infections are sometimes more than simple angina due to a non-toxigenic hæmolytic streptococcus; and that the organism concerned may produce scarlet fever if transmitted to a person susceptible to the toxin. From what has been said recognition of scarlet fever many times depends as much on epidemiological as on clinical methods of diagnosis.

Some of these epidemiological relations need to be better defined, and more quantitative information is required for most of them. The prevailing serological types of hæmolytic streptococci in scarlet fever of a given community should be known. The relative frequency of these types in sore-throat and in other streptococcal diseases could then be determined. There remains the important consideration of how uniformally active in the production of toxin are serologically identical strains isolated from scarlet fever and from other clinical conditions. The laboratory methods required for such field studies are available. The information gained should contribute to a more comprehensive programme for control.

The universally appreciated difficulties in determining sources of infection in scarlet fever suggest that more cases arise from atypical disease than from frank clinical attack. The rôle of carriers is almost undefined. It is essential to have some idea of the frequency of carriers known to harbour strains concerned with scarlet fever of the community; of the extent to which the carrier state represents subclinical or latent infection; and of the frequency and significance of the so-called healthy carrier. Recent work on malaria and on pneumococcal infections suggests that carrier-rates increase appreciably and persist thus for relatively long periods before an epidemic appears. The establishment of such values for scarlet fever would be of practical value in estimating the probable importance of an incipient outbreak.

Since so little has been accomplished by general measures in limiting the spread of the infective agent, further attention must be given to the possibilities of specific immunisation. It is essential to know whether immunisation with erythrogenic toxin acts only in relation to a part of the clinical syndrome of one kind of hæmolytic streptococcal infection—the toxic component of scarlet fever—or whether it effectively protects against all clinical reactions to a toxigenic hæmolytic streptococcus, those with and without rash. On that consideration depends its value as a general public-health measure for limiting the spread of the agent. There is also need for an improved antigen; such a product should be as efficient as that now used but more readily acceptable administratively and unattended by the severe reactions which limit the usefulness of the present method.

Scattered evidence suggests that concurrent epidemics of colds and influenza are often the important factor in determining the sharper and more extensive outbreaks of scarlet fever. The relation between measles and streptococcal disease is well established. An attack on coexistent epidemic respiratory disease is a logical procedure in attempting to interrupt the spread of scarlet fever.

Specific methods of treatment that include hæmolytic streptococcus antitoxin, human convalescent serum, and immunotransfusion have had a favourable effect on case-mortality. Complications are more important than the acute infection as the cause of death in scarlet fever. The demonstrated importance of reinfection in the production of complications makes necessary more adequate provision for individual isolation in hosptials. This can be facilitated by a more general policy of isolating mild cases at home.

Several countries have substituted periods of isolation considerably less than previously required, with equally satisfactory results as judged by secondary attack-rates among direct contacts, and with material savings in cost of hospital isolation and in time lost by patients from normal activities.

There is no justification for complacency about scarlet fever because of the existing favourable situation as regards clinical severity and case-mortality. The present time seems to be appropriate for attempts toward a better understanding of epidemiological relations, and of methods for prevention and control, if the long-term variations in behaviour that scarlet fever has shown throughout history are of any significance.

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IN ENGLAND NOW

A running commentary from our Peripatetic Correspondents

How many people, in or out of the profession, know what beautiful, what palatial, what well-designed and equipped hospitals have been built by county councils for infectious diseases, for tuberculosis, for children, for the mentally defective and insane? Who would expect to come across, in the grounds of a great asylum, a thoroughly modern surgical hospital of a hundred beds?

In some county hospitals the visitor finds the medieval and the modern cheek by jowl. At X, for example, he draws up to the door of what looks like a little fisherman's inn, and goes down a step from the porched front door. Into the tap-room on the right? No, that is the medical superintendent's office. Into the parlour on the left? No, that is the matron's working quarters. But where is the hospital? Wait! Past the top of steep stairs that should lead down to a cellar crammed with barrels waiting to be broached, out past the offices and stables, now horseless, down the garden path skirting the cemetery that is only half screened by young trees, to a newish building that holds a modern theatre, an excellent maternity clinic with proper labour-room, an X-ray department, and well-found and quite adequate wards. That example may be unique, but many of the old public assistance institutions have central buildings dating back a hundred years or thereabouts which should be hidden from the eyes of visitors from advanced countries such as Esthonia, Finland or Latvia, and which would provoke any American visitor to exclaim "I don't believe it." Yet these same institutions often boast in their grounds a "hospital block" such as the one described, that is far from being a disgrace, and may be really good.

Only Dickens could describe the conditions in which the poor old people live in the workhouse (for this rose under another name is still faded and malodorous). Perhaps it is not really so bad as the chill it sends to one's bones on first sight, for in the nurseries the children seem well fed, not too uniformly clothed, well supplied with toys, and happy. Sometimes the master and his wife, the matron, seem capable, interested and kindly; sometimes the nursing under such a matron, one suspects, must be of a poor standard, and the doctor himself is not always very spry. At one institution after a round with the master in which the visitors were accompanied by a seedy individual, seemingly dumb ("M.D." in the terminology of the Board of Control rather than the university), a casual question elicited the information that he was the medical officer of the institution.

There is one cheering aspect of some of these visitations. Municipal and county hospitals which have such an abundance of first-rate clinical material for educational purposes have in many instances spread their riches before attached students, and their staff have taken delight in teaching. Often enough students have been reluctant to leave their places of exile, where they saw, heard and did so much, to return to the parent hospital and school, where they were insignificant nonentities so far as responsible work was concerned. The staffs of many great county-council hospitals are inadequate, not merely compared with the almost overstaffed teaching hospitals, but, on the surgical side at any rate, also inadequate to give that detailed after-treatment which should be in medical rather than nursing hands. If the consulting staffs of voluntary hospitals have learned something from the municipal hospitals to which they have gone, they have also helped or stimulated the overburdened men and women whom they found there.

* * *

It was a wise nurse who made a bee-line for one of the fighting services at the outbreak of war. For her there was at least board and lodging, a chance of recreation, prompt pay and a prospect of good work. But hospital sisters and nurses already on the register though tied to their engagements, probationers, and those still in training suffered in many cases a grievous upheaval. Great numbers of them had anything but a square deal. The same is true of large numbers of registered nurses who had to "stand by" unpaid for weeks and weeks, waiting the call-up that never came. It must have been galling to see enormous numbers of worthy but largely untrained auxiliaries in F.A.P.s and mobile units enrolled and paid for receiving training rather than doing the job of nursing, and still more galling to see them sometimes doing that nursing in a hospital where a registered nurse would have been taken on and paid, if money had not been stayed somewhere between its source and its distribution. It is not credible that a country which could pour money to waste on A.R.P. personnel could not and would not have found money to pay the nurses whom it had bidden to stand by, were it not that no lead had been given as to who should deal it out. Why should a county council or a hospital board pay out wages to three hundred alien nurses suddenly dumped on its premises? Why should a voluntary hospital, in fear for its financial survival, pay for services that might not be needed, but ought to be on tap?

Nurses were given insanitary billets; they had to walk two or three miles through all weathers to their work, and sometimes had to do the journey each way twice a day; they had nowhere to hang their wet outdoor clothes, or if they had bicycles, nowhere to put them; they had indifferent food. Of those who "lived in," hundreds of nurses housed in wards had no cover for their clothes, which hung exposed in the ward when it was swept; many of them had nowhere to sit, to write, to sew, to play, other than the crowded dormitories; their quarters had inadequate sanitary arrangements. Matrons had anxious days, and indeed, though some may think it unlikely, an aching heart over their dispersed family. How were the nurses to be taught their job? How was their education to be conducted? How were they to be sheltered from mischief? How in fact could the matron fulfil her contract with a girl's parents, for

PROF. GORDON: REFERENCES (*continued*)

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it covered more than just instilling the elements of professional skill, it included the maternal care which went to the strengthening of character. There was, and is, as everywhere, another side to the picture. Many nurses found themselves in beautiful homes; not everyone who went from a London hospital found inferior conditions. Some discovered quarters of the highest quality where they had little expected them; many found a class of work which hitherto they had not met, and enlarged their experience; some found themselves with increased responsibility and many found valuable contacts with nurses of another school.

Nobody will be surprised to hear how uncomplainingly, with what resource, many bodies of nurses buckled to the task of making inadequate quarters endurable, of transforming the shabby into the charming, of camouflaging the makeshift with taste and skill. The problem of the nurse is still far from solved. The glib excuses—that there's a war on or that things were worse in the last war—the complacent platitudes of those whose responsibilities have been unfulfilled, go but a little way to cover the defects and deficiencies that have made life difficult for nurses. But it is not nurses only who have been asked to suffer discomfort and inconvenience. How many of us have ever entered the casual ward of a workhouse? Today it is possible to find a senior physician of one of the London teaching hospitals, and many of his junior colleagues, billeted in casual cells. The room just holds a narrow bed, a chair, a flat cupboard hung high on the wall over the bed, and is lit by a window eighteen inches by twelve. There are no complaints.

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The regional medical officers have given up sending out RM2's, though I see they are now coming back to the old stand. Meanwhile, what about our alleged "excessive prescribing"? I don't suppose we have all changed our methods. Indeed, we in these parts were reminded that this is not so by the arrival from the clerk to the insurance committee of a circular letter informing us that for the future we should be allowed to prescribe M. & B. 693. In practice, of course, we have been doing so ever since the great value of the drug has been generally recognised. It came as a bit of a shock to many of us that we had been making ourselves liable for surcharge. Or did it? Should we not, rather, laugh? While Authority has been trying to bring itself to the pitch of allowing us to spend money on a new expensive drug we have been doing it, to the great advantage of patients sick with a killing disease.

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The blackout is playing ducks and drakes with our clinical teaching. I wrote this in bitterness before the winter gloom began to yield with Saint Lubbock's help. But the problem may recur and should be faced. Late afternoon lectures or classes are taboo, for students must start for home before the dark; so the mornings, reserved in peacetime for work in the wards, are now largely dotted with classes in pharmacology, pathology and the rest. My clinical clerks, most of whom are in their first term of medical clerking, have only the broken remnants of two mornings and one afternoon during the week to study their cases by themselves—hardly four hours in all. Verily "the Art is long, and Time is fleeting," even though they have in addition two formal ward clinics and two outpatient clinics weekly.

What can we do about it? To be confronted at the bedside by a group of students none of whom have anything but the most superficial knowledge of their patients is an altogether new situation. Their parents are paying good money in hard times for their medical education; is it inevitable that they will suffer badly from mental malnutrition, or have they a chance of developing a raw-boned stamina akin to that of the product of porridge and the shorter catechism? Adversity may have its sweet uses here as elsewhere. In the October term my clerks were a lively, alert group; war-time difficulties only made them more eager to make the most of their time in the wards. Owing to their keenness and initiative, the term was as bracing and adventurous as though we had been a party of polar explorers. My present batch I hardly know as yet, for so far either I or they have been absent with "influenza," so that I cannot say whether they too will fuse into a corporate team, working out their own salvation. I can, however, recall occasional blasé batches of clerks in peace-time who obviously were not going to bestir themselves until I (as master of the ceremonies) seized them by the elbow and took them over to introduce them to Miss Medicine; unable to dodge their obvious duty, they would then give her the next dance.

With so little time available, it is difficult to give proper opportunity for "the love of the art" to take root and grow. Education of our students is a process as slow and unhurried as growth, and calls for the watchfulness, wisdom and patience of a good farmer with his crops and livestock. The most that the teacher can really hope to do is to put his students in the way of fending for themselves, to protect, feed and exercise them while they grow up in Medicine.

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The immunisation of 850 children against diphtheria in a small country town proved a far less formidable undertaking than was expected. The preliminary organisation was much more of a business than the job itself, but the local authority raised no obstacles and the school teaching staffs were most coöperative—indeed it was largely owing to their efforts that over 90 per cent. of the parents consented to have their children done. The cost, including such overheads as publicity, printing and a boiled sweet for each child inoculated, worked out at less than two bob a knob. With the help of the welfare nurse and some kindly V.A.D.'s, two doctors working together could easily inject 150 children in an hour, and the magic phrase "I shan't give you your nice injection if you cry" quickly dried the few tears of apprehension encountered. It was noted that, whereas the girls could be trusted to help themselves to one sweet only, the morality of the boys, was less reliable; nor was that of the doctors altogether above reproach.

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So the public schools are doomed once more. They have been doomed so often that they ought to be used to it by now. Among the hardest of the many hard things said about them is the Nazi assertion that they are luxurious playgrounds for the sons of the idle rich. I am not so old as to have forgotten the ecstasy of lugging the captain's cricket bag—apparently loaded with ingots of lead—across the ground from the changing-room to the pavilion on a really hot July day; nor the keen pleasure of struggling in the tuck-shop to procure for oneself a fivepenny lunch in time to enjoy the sybaritic privilege of playing rugger for 70 minutes in the sleet; nor the halcyon route-marches with the O.T.C.; nor the luxury of sharing a bell-tent with seven others and a great deal of clothing and equipment at camp. At my particular seminary there was too a lamentable absence of velvet on the desk-seats.

SPECIAL ARTICLES

EARLY TREATMENT OF CEREBROSPINAL FEVER

THE War Office has now issued an addendum to their previous pamphlet on the diagnosis and treatment of cerebrospinal fever, which was similar to that lately published for the Ministry of Health. The addendum deals in particular with the early treatment of suspect cases by chemotherapy. It points out that the onset of the disease is sometimes so insidious that its nature may not be recognised. It is essential therefore to lose no time in ensuring the absorption of the drug. Whenever there is a suspicion that there has been any delay in recognising the condition, whether the patient is conscious or unconscious, the first dose should be an intramuscular injection of M. & B. 693 soluble (Dagenan sodium). As soon as meningeal involvement is suspected the injection must be given. It must not be delayed until the case is admitted to hospital or lumbar puncture performed. The suggested scheme for the administration of the drug is as follows.

Cases whether conscious or unconscious.—The first dose should be 1 g. (3 c.c.m.) of M. & B. 693 soluble by intramuscular injection. If the patient is unconscious this injection should be repeated four-hourly. If the patient is conscious and able to swallow, give 1 g. of M. & B. 693 in tablet form, or crushed and dissolved in 100 c.cm. of hot citric acid solution (roughly 1 per cent.) or hot lemon, by the mouth two hours after the intramuscular injection and then 2 g. by mouth four hours later. (This represents approximately half the total twenty-four hour dose).

Fulminating cases.—In these the onset is extremely rapid and it is essential that there should be rapid mobilisation of the drug to all the tissues. The suggested scheme in such cases is to give an intravenous injection of 1 g. (3 c.cm.) of M. & B. 693 soluble, diluted in three or more volumes of saline, and at the same time an intramuscular injection of 1 g. of M. & B. 693 soluble. These should be followed by another intramuscular injection of 1 g. M. & B. 693 soluble four hours later. Subsequent doses must depend on the condition of the patient. Three or four pints of fluid daily should be given by whatever method is practicable, either oral, rectal, subcutaneous or intravenous.

With regard to the intramuscular injections the leaflet urges that since M. & B. 693 soluble is very alkaline and may cause necrosis in subcutaneous tissue care must be taken to ensure that the injection is made deep into the muscle. Pain is often experienced during the injection of the drug which must be given slowly. In addition patients suffering from cerebrospinal fever are often restless and irritable. The following technique is suggested.

Fill a 1 c.cm. Record syringe with 1 per cent. Novocain. Attach to it a No. 2 serum needle. Raise an intradermal wheal with novocain, drive the needle through this, injecting as it goes until full depth is reached, whereupon inject 0·5 c.cm. of novocain. Detach the syringe from the needle. Attach a 5 c.cm. syringe filled with the dose of M. & B. 693 and inject the drug slowly. Detach the 5 c.cm. syringe. Re-attach the 1 c.cm. syringe containing 0·5 c.cm. novocain. Inject 0·25 c.cm. of novocain to clean the needle. Withdraw the needle, injecting novocain to fill the needle track and prevent the escape of M. & B. 693.

The leaflet ends with a reminder of the importance of sending a note of the nature, dose and method of administration of the drug that has been given with the patient when he goes to hospital.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

PSYCHIATRIC ASPECTS OF CRIME

IN an address to the Scottish branch of the British Psychological Society in Glasgow on some medico-psychological and legal aspects of crime, Dr. Angus MacNiven said that the present methods of treating offenders often did not satisfy two essential conditions —that they should protect the public, and if possible reform the offenders. Each offender was dealt with by the imposition of a penalty. No attempt was made to ensure that the penalty fitted the peculiar needs of the individual offender. The psychological make-up of each offender should be investigated and the curative measures adopted should be akin to those used in the treatment of mental illness. Serious defects, however, were involved. Only a minority of delinquents responded to psychotherapeutic treatment. The protection of society requires, in the majority of instances, some form of detention and supervision, but the encroachment on individual liberty constituted a serious objection. In the case of the insane the law permitted the patient to be detained until he was either cured or was no longer a danger to himself or to society, but the criminal and the insane person differed in so many ways that the procedure which was successful in one might have grave objections if applied to the other. The legal system ensured the minimum of encroachment on the individual's privacy and liberty, whereas medical treatment, especially psychiatric, demanded the surrender by the patient of his liberty of action. There was no objection to the physician assuming the rôle of dictator as long as the patient was at liberty to accept or refuse the advice he was given; but in the medical treatment of delinquents a degree of compulsion was usually necessary, entailing a greater sacrifice of the offender's freedom than was at present demanded by the law. The rigidity and apparent lack of humanity of the criminal law was intended to be a safeguard against emotional bias on the part of any individual or group. The medical attitude was much less rigid and in many cases more appropriate to reality. The claim of the psychiatrist to a more important part in the treatment of delinquency had been put forward convincingly from time to time, but under the present system any contribution which the psychiatrist could make in an individual case was received willingly and sympathetically by the courts. It was better to allow the legal system to evolve gradually in the direction of conformity with the medical concepts of crime than to introduce sudden drastic changes which were open to objections.

ROYAL HOSPITAL FOR SICK CHILDREN, GLASGOW

At the annual meeting of the Royal Hospital for Sick Children, Glasgow, the chairman of the board of directors said that in the hospital at Yorkhill and in the country branch in Dumbartonshire they now had 392 cots. The patients were all under thirteen years of age and came from all parts of Scotland and beyond. Recently they had had a patient from Iceland. The directors had considerable extension and building schemes in view when times became more

propitious. These included a special orthopædic department, a lecture and demonstration hall, additional surgical and orthopædic wards, an operating theatre, additional accommodation for resident doctors, nurses and maids, and accommodation for paying patients. As a result of the demands of the fighting forces there was a shortage of physicians and surgeons. Lord Provost P. J. Dollan expressed the hope that the Government would hold the balance between the needs of the military and civil defence services and the civilian population.

DR. ISABEL BEATTIE VENTERS

The death in Edinburgh on March 13 of Dr. Isabel Venters brought to its end the career of the senior medical woman in Edinburgh and one of the pioneers in medicine as a career for women. She was born in 1869 at Blairgowrie and trained in Edinburgh with the late Dr. Sophia Jex-Blake, taking the University degree of M.B. in 1897, as soon as it was open to women. She also held the triple qualification of the Scottish Royal Colleges. She was the first resident at what is now Bruntsfield Hospital when it was founded more than fifty years ago by Dr. Jex-Blake. She remained on the staff as surgeon until about seven years ago when ill health obliged her to retire. Dr. Venters had one of the best women's general practices in the city. She was readily accepted by the medical profession even in the early days and will be widely missed for her quiet attractiveness and sagacity.

At the annual meeting of the Bruntsfield Hospital and the Elsie Inglis Maternity Hospital Mrs. James C. Johnston, the chairman of the hospitals, paid a tribute to her. She said that the lives of Dr. Jex-Blake and the young doctor on whose shoulders she laid her mantle when she left Edinburgh in 1899 spanned together the century that covered the women's quest for medical education and opportunities, when Dr. Venters took charge of the new hospital at Bruntsfield Lodge, it was no small burden that she assumed. How well she bore it we realise today when the number of beds have risen from 6 to 130. However busy she was in her professional work she made time for executive meetings and conferences. This was the more remarkable since she carried the surgical side of the hospital for her first eight years without assistance and again in 1914–20.

PATHOLOGY OF VOICE AND SPEECH

Dr. Douglas Guthrie delivered a Honyman Gillespie lecture in Edinburgh last week on this subject. Dr. Guthrie affirmed that a knowledge of the physiology of the production of speech was of fundamental importance since most of the errors associated with voice and speech were functional rather than organic in origin. Correct respiration was necessary during speech which was produced during the expiratory phase by the relaxation of the intercostal muscles and the steady pressure of the relaxing diaphragm forcing the air over the vocal cords. Speech should produce no sense of constriction in the chest as this tended to early fatigue and the normal depth of inspiration and expiration should be used. The laryngoscope was of little use in investigating the movements of the vocal cords as the vibrations varied between 100 and 1000 per minute, but he had obtained interesting results with the stroboscope in the analysis of cord movement. Particular attention was paid to the range of the voice during the development of the child. The voice of the newborn infant was limited to one note. As it grew older the range increased but remained relatively restricted even up to puberty. That this was not always appreciated was shown by the fact that many of the songs written for children were outside the physiological range of young voices. Singing or attempting such songs resulted in undue strain early in life and might be the basis of difficulties in speech and singing in later years.

Disorders of articulation were common even in normal children. Stuttering, dyslalia and lisping and even stammering might be present for short periods as the voice developed. A child was very imitative not only in its action but also in its speech. Thus "baby talk," with its replacement of difficult consonants by more easily pronounced ones and the repetition of syllables should never be used in front of infants. Stammering, the most serious form of articulation error, was undoubtedly a neurosis of anxiety or fear. Although the defect was handed down in families this might be the result of imitation rather than heredity. As it was psychic in origin treatment should be along psychological lines. The environment should be carefully investigated, particular attention being paid to the impatience of teachers and the gibes of companions. Too much attention should not be directed to the voice itself. Stammering was more a local manifestation of a general psychological upset than an error in speech.

Dr. Guthrie deprecated the tendency of the specialist to pay insufficient attention to the functional examination of the voices of singers and public speakers and to devote too much to the examination of the organs. Most of the troubles were functional in origin, and the commonest causes were speaking too loudly, breathing incorrectly, and using too high a range. Any lesions which might be found were usually secondary to these functional disorders and were not the primary factors. Here again the treatment lay in training the patient to speak or sing according to physiological principles, so as to correct errors in respiration, and in the institution of orthophonic exercises.

MEDICINE AND THE LAW

Workmen's Compensation and Progressive Disease

LAST week the House of Lords extended afresh the meaning of "injury by accident" in the Workmen's Compensation Act in relation to progressive disease. William Young, employed by the Fife Coal Co., worked as a packer. The crouching position involved in his employment exposed the outside of his right knee to repeated pressure. The pressure on the peroneal nerve passing over the bone below the knee induced the condition known as dropped-foot, a paralysis of the leg muscles resulting in an inability to raise the front part of the foot upward. Total incapacity due to dropped-foot was stated to be rare. The sheriff-substitute of Fife and Kinross found that Young's total incapacity from this cause did not result from "personal injury by accident arising out of and in the course of the employment," the familiar and much disputed words in the act. He therefore held that the company was not liable. The Court of Session reversed the finding and the House of Lords has dismissed the company's appeal. There was no dispute that the incapacity arose out of and in the course of the employment. The sole question was whether there had been "injury by accident."

As was explained in the Lord Chancellor's careful review of the successive extensions of the phrase, the courts were at first inclined to interpret "accident" in the sense in which the word is used in insurance policies—some event of a fortuitous and

unexpected character. In Fenton *v.* Thorley (1903), where the workman ruptured himself in an act of over-exertion, Lord McNaghten discarded the test of fortuitousness and gave "accident" its popular and ordinary sense—an unlooked-for mishap or an untoward event which is not expected or designed. He cited with approval Lord M'Laren's dictum in Stewart *v.* Wilson's and Clyde Coal Co., "a physiological injury" to the workman "as a result of the work he is engaged in." Lord Caldecote has now held that dropped-foot comes within this definition. In Fenton's case Lord Robertson spoke of accident as "any unintended and unexpected occurrence which produces hurt or loss." Two years later, in Brintons *v.* Turvey, Lord Robertson objected to the extension of "accident" to cover disease; yet the court held that the infection of a wool-sorter with anthrax was within the statute. The judges seem to have been able to visualise the impact of the bacillus as a definite event. Soon afterwards the House of Lords refused to say that beat-hand and beat-knee were an accident for the purposes of compensation (Marshall *v.* East Holywell Coal Co., and Gorley *v.* Backworth Collieries). The refusal was based on the ground that the injury was the inevitable result of work long continued and not of any particular happening in a particular duty. So also in Walker *v.* Hockney Bros. where the workman gradually acquired paralysis over a 5-year period by riding a carrier bicycle, the employer succeeded in escaping liability. It was not because a disease could not be an "accident," but because the applicant had not proved that there was an "accident." Proof is obviously difficult where the disease is progressive. Parliament therefore enacted in 1906 that a group of industrial diseases (afterwards enlarged) should be deemed accidents, to relieve the workman of the burden of proof. Where, however, the workman can discharge that burden, he can establish that a disease is as much an accident as was the ruptured aneurysm in the Clover Clayton case in 1910 or the heart failure in Falmouth Docks &c. *v.* Treloar in 1933. In Steel v. Cammell Laird (1905) the court felt unable to allow compensation where the workman had gradually accumulated lead in his system, though now, of course, "lead poisoning or its sequelæ" can be found among the industrial diseases in the statutory schedule. There was a like result in 1926 in Williams *v.* Guest Keen and Nettlefolds, a case of silicosis of a type then not yet scheduled. Lord Justice Atkin, though feeling bound to reject such claims, observed that there was a tendency to approximate the meaning of accident to that of disease.

The final stage, in the Lord Chancellor's view, was reached in Walker *v.* Baird and Walkinshaw *v.* Lochgelly Iron and Coal Co., both decided in 1935. In the one a colliery foreman died of bronchial pneumonia caused by a chill contracted during exposure to coal and water while cleaning a sump. Lord Tomlin said the pneumonia was due to the sudden and unexpected onset of a chill contracted in conditions normal to the carrying out of the job and frequently experienced before without ill effects. The chill was "an untoward event not expected or designed." In the other a pit worker, supposed to be in good health but in fact suffering from heart and kidney disease certain to result sooner or later in cardiac breakdown, one day had to cease work owing to sudden pain and choking. Lord Tomlin said that the hard work on which the claimant was engaged induced the breakdown of his enfeebled heart; this involved a definite change in his condition on April 29. The Lord Chancellor says that William Young's dropped-foot is indistinguishable in principle from Walkinshaw's heart attack. The pressure on the peroneal nerve during a spell of work on a particular day caused the paralysis of the leg muscles. Young sustained a "definite physiological injury in the reasonable performance of his duties." The employers had apparently relied on evidence that, for a month before the day on which Young suffered from dropped-foot, he had felt unable to bend the foot upwards. The House of Lords says that the existence of these previous symptoms in no way affected Young's right to compensation. Thus the law struggles to perceive a definite moment at which the gradual deterioration goes just too far for the balance of human health. Instead of the legislature enlarging the definition of industrial disease, with a consequent impetus to preventive measures, the courts must grope for a visible stage of accident in an imperceptibly progressive disability.

PUBLIC HEALTH

Cerebrospinal Fever

FOR the second week in succession the notifications of cerebrospinal fever show but a small increase, the number reported in the week ended March 2 being 623 compared with 585 in the previous week. The corrected weekly figures since the beginning of the year now read 53, 107, 144, 184, 299, 406, 557, 585 and 623. Subdivisions of the country into regions shows that the slight rise in the last two weeks is mainly confined to the southern and midland counties and in other areas the incidence is stationary or very slightly declining. Prediction is a dangerous pastime but the figures clearly suggest that the epidemic has virtually reached its maximum. On the other hand past experience cannot raise hopes that the fall will be as precipitious as the rise. It may well be many weeks before a normal level is again reached.

Infectious Disease in England and Wales

DURING THE WEEK ENDED MARCH 2, 1940

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 975; whooping-cough, 571; diphtheria, 767; enteric fever, 11; measles (excluding rubella), 4535; pneumonia (primary or influenzal), 2243; puerperal pyrexia, 203; cerebrospinal fever, 623; poliomyelitis, 9; polio-encephalitis, 1; encephalitis lethargica, 7; dysentery, 45; ophthalmia neonatorum, 87. No case of cholera, plague or typhus fever was notified during the week.

To the 623 cases of cerebrospinal fever Berks contributed 11; county of Derby 25 (Derby 13), Devon 11 (Exeter 4), Durham 13, Essex 18 (Colchester 5), Kent 31 (Ramsgate 7), Lancaster 52 (Liverpool 14, Manchester 8, Morecambe and Heysham 6), County of London 33 (Lewisham 4), Middlesex 18 (Heston and Isleworth 7), Nottingham 11, Somerset 17, county of Southampton 51 (Bournemouth 4, Portsmouth 23, Southampton 9), county of Stafford 25 (Walsall 6, Stafford 8), Surrey 24 (Croydon 6), Warwick 27 (Birmingham 20), Wilts 16 (Devizes and Pewsey each 4), Yorks (West Riding) 27 (Leeds 7), Denbigh 15 (Wrexham M.B. 9, R.D. 6), Glamorgan 37 (Cardiff 11, Swansea and Rhondda each 6), Monmouth 16 (Newport 7).

Deaths.—In 126 great towns, including London, there was no death from smallpox, enteric fever or scarlet fever, 4 (0) from measles, 2 (0) from whooping-cough, 29 (0) from diphtheria, 33 (3) from diarrhœa and enteritis under 2 years, and 512 (41) from influenza. The figures in parentheses are those for London itself.

Fatal cases of diphtheria were scattered over 19 great towns, Liverpool reporting 5. There were 6 deaths from diarrhœa at Birmingham. Belfast had 13 deaths from measles the same week.

Deaths from influenza, as briefly noted in our columns last week, fell from 629 to 512. Of the 471 outside London 93 were reported from the south-eastern area (Reading 8, Southampton and Hastings each 7); 198 from the northern area (Sheffield and Manchester each 21, Liverpool 16, Blackburn 11, St. Helens 9); 112 from the Midland area (Stoke-on-Trent 21, Bristol 19, Birmingham 16, Leicester 12); 33 from the eastern area; and 17 from the south-western area. In the same week Belfast reported 18 deaths, Glasgow and Dublin each 15 and Edinburgh 11.

Research by School Medical Officers

Every year in "The Health of the School Child," the chief medical officer to the Board of Education gives a list of special inquiries and reports culled from the annual reports of the school medical officers, which are the fruit of researches undertaken by those officers and their assistants. In his last annual report the C.M.O. remarks that this list "shows how the School Medical Service (which some unwisely think to be, as regards clinical interest, a wilderness of arid routine) can be made to blossom abundantly." Blossoms have been known to waste their sweetness on the desert air, and this fate is usual for those cultured in the school medical service, for few of these records of research get further than the local school reports. They deserve better treatment, because although in general they deal with subjects which are not of dramatic interest, and reveal no sensational discoveries, they supply us with the best raw material available—facts actually observed and systematically recorded from an unselected population of known ages and conditions—for building the science of human biology. Many of these researches require years, and sometimes generations, for their fulfilment and call for labour and perseverance which should not go unrewarded. The subjects chosen vary with what is uppermost in the medical mind of the time; thus in past years the outstanding investigations have been on goitre, tonsils and adenoids, child rheumatism, and so on. Lately nutrition has held the field and in 1938 out of 69 special reports 16 dealt with nutrition. We propose in this column to draw attention to some of the more important researches completed or in progress. The original papers can always be obtained from the authors.

Dr. F. J. G. Lishman, in Dr. Cowan's report for *Gloucestershire*, surveys the nutritional state of elementary school-children. He gives a list of what in his opinion are signs of malnutrition and the nutritional deficiencies likely to cause them. As an example: Inadequate rate of growth, a sign; the cause, insufficiency of all food, "especially first-class protein (containing essential amino-acids, tryptophane and lysine), also a vitamin B factor (lactoflavine)." Not everybody will agree that all Dr. Lishman's signs do connote malnutrition, or that there are not other signs of equal moment, nor will all his alleged causes be accepted as proven, but this does not detract from the value of his survey. Using his own standards, no significant difference was detected in the nutrition of the children of the agricultural, industrial, mining and residential areas of the county. This is important, for the Gloucestershire mining areas are unprosperous, whereas the agricultural districts are prosperous. Girls show a significant superiority over boys. The nutrition of the youngest children was best, that of intermediates (seven to eleven) worst. Nutrition, as measured, appears to deteriorate from six to nine and afterwards improve.

Dr. J. A. Fairer, in his report to the education committee of *Leicestershire*, analyses the deaths of children and young adults aged 1 to 24 years in the county between 1903 and 1937. Dividing the quarter of a century into periods and the fatalities into the three age-groups, pre-school (1–4), school (5–14) and young adult (15–24), the rates and age and period variations of the chief killing diseases of early life are exhibited in clear form. At school age, in the pre-war and pre-medical-inspection period (1903–07) the seven main causes of death in order of frequency were: non-respiratory tuberculosis, diphtheria, phthisis, heart disease, violence, pneumonia and scarlet fever. Non-respiratory tuberculosis sank to second place in the early war period (1913–15), resumed first place in the post-war period (1923–27) and sank to third place in the recent period (1933–37). Its death-rate sank steadily: 0·37, 0·28, 0·21, 0·12. Diphtheria was second in the first and third periods and first in the second and fourth periods. Its death-rates were: 0·36, 0·35, 0·20, 0·20. Scarlet fever was seventh in the pre-war period and then disappeared from the list of chief causes, its place being taken by appendicitis, which first appeared in the second period and has maintained seventh place thereafter. The death-rates from all causes per 1000 at risk were 2·37, 2·49, 1·81, 1·55. The only cause of death which has actually increased is violence, the rates for which were 0·15, 0·18, 0·12, 0·19.

In the report of Dr. Arthur J. Smyth, school medical officer of *Cambridge*, Mr. W. Baird Grandison, public dental officer, gives the results of a special investigation conducted by the three dental officers into the condition of the teeth of three groups of children—100 aged three years, 250 aged four years, and 450 aged five years. The results are presented in three tables without commentary. The children were unselected, except for age, and had not received any dental treatment. From these tables we learn the distribution and march of caries in each of the twenty deciduous teeth, the history of their fall and replacement before the first permanent teeth normally erupt, and the indications for dental treatment and what can be expected from it. This tells us nothing which was not suspected, but it gives us facts to replace impressions, so anybody attempting to unravel the causes and pathology of caries would have to make his theory square with those facts. There are many other ways in which these tables may be useful, for instance, the different resistance to caries of the individual teeth may throw light on the evolution of man's dentition and reveal errors in the use he makes of his deciduous teeth. At five years old about 95 per cent. of the lower biting teeth are still sound, whereas only 35 per cent. of the molars have escaped disease.

The aural clinic of the education committee of the borough of *Tottenham*, established many years ago under Dr. A. R. Friel, has had a great influence in reforming the treatment of otorrhœa in children, and the record of its work in the annual reports of the school medical officers, the late Dr. Kirkwood and the present M.O.H., Dr. G. Hamilton Hogben, is a history of continuous research. This is one of the most valuable contributions which the school medical service has made to clinical medicine, but outside the school service it has received less attention than it deserves. This clinic established the high values of ionisation and diastolisation in the cure of chronic ear and nasal diseases. Research is continuing in the use of audiometers, both gramophone and pure tone, in the detection and grading of deafness, the classification of aural discharges, and the influence of tonsils and adenoids and their treatment on ear conditions. Researches in audiometry are proceeding in many places, for instance, in Birmingham hearing testing is carried out on a large scale by special audiometer units. This work is so pre-eminently school medicine

that interest in it is mainly confined to the school service.

Plantar warts attracted much attention in 1938. They received special mention in the school reports of London county, Kent county and Cardiff C.B. A more comprehensive report on plantar warts in school-children by Dr. Andrew W. Forrest, school medical officer, and Mr. F. J. O'Brien, senior chiropodist, was published in the school report for *Leyton*. After discussing ætiology and pathology, the authors give a table of the results of their inspection of 7304 children. Amongst 3585 juniors there were 83 plantar warts, amongst 3719 seniors there were 175. The warts were more common in girls than in boys, especially amongst the juniors. The incidence in the various schools of the borough varied from 1·02 to 7·91 per cent. The condition is commonest between the ages of eleven and thirteen. "It was customary," says the report, "to find from 50 to 60 per cent. of affected children in a particular school grouped in one classroom." The evidence from Leyton is against the commonly held view that plantar warts are spread by swimming or paddling; against the view that they are spread by "communal" plimsols; or that they are favoured by wearing wellingtons, by the irritation of tar compounds on school playgrounds, or by barefoot dancing. It supports the view that the wearing of thin rubber shoes is a causal factor. Sir Arthur MacNalty suggests that examination of the bare feet should be part of routine inspection. Doubtless the apparent increase in plantar warts has had something to do with this suggestion, but the frequency of foot deformities and the flat-foot problem are sufficient excuses for this addition to inspection.

Dr. G. E. St. Clair Stockwell gives five pages of the *Leeds* school report to an investigation into the use of the Leeds reading-aid for partially sighted children. This aid is essentially a desk with a fixed magnifier and is especially valuable in the education of high myopes. At the Special Schools Conference in Cardiff in 1939 the aid was demonstrated by Mr. G. Black, consulting ophthalmologist to Leeds education committee, who conceived the apparatus, and Mr. Andrewes and Mr. Hardcastle, head teacher and assistant of the School for Blind Children, who developed it for educational uses. The apparatus enables myopes of the partially-sighted degree to pursue normal education without detriment to their eyes. Children with the handicap of myopia of too high degree for education along ordinary lines—that is, requiring something more than the provision of spectacles—have for years been an outstanding problem of special education. Many of them are of exceptional intelligence, led by their defect to pursue a studious life, and have given us some of our most gifted citizens, including several prominent ophthalmologists. The Leeds aid enables them to read ordinary books. So far the results show that education with the aid keeps the visual acuity constant in most cases. Out of 58 children so taught only 4 have shown an increase of myopia and in only 1 was the increase greater than the average yearly increase before treatment. Details of the apparatus and how to use it may be obtained from Dr. Stockwell.

PARLIAMENT

ON THE FLOOR OF THE HOUSE.

By MEDICUS, M.P.

THE Old Age and Widows' Pensions Bill passed its third reading on Monday of last week and will soon be law. Mr. Walter Elliot in summing up the debate said that the Government were attempting to do two very difficult things, "to combine an advance in social reform with the vigorous prosecution and maintenance of a great war." On the Labour side, apart from the provisions extending pensions to a lower age-group of women, the bill is regarded as part of a new poor law. The Minister of Health proclaimed the desire to produce "a property-owning democracy, the liquidation of democracy." When the lone supporter of the Communists interjected "You will never get it under capitalism," the Minister replied that "The Hon. Member will have an opportunity before he is liquidated of making his full statement in his own community, and I hope he will allow me to make my statement tonight in mine." But if Mr. Elliot did not show how the bill would lead to a property-owning democracy he did give a useful summary of the income which would be disregarded for means-test purposes; this includes "the value to any person of a house in which he or she lives and the first £25 of any savings or capital."

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The next day Mr. Oliver Stanley made his statement on the Army estimates and devoted a large part of his speech to the medical services. The difficulties there had arisen very largely from the rapid increase in size of the Army. When the Territorials were doubled the medical services were not doubled so that there has had to be an enormous expansion since the beginning of the war. Ninety per cent. of the medical officers now serving were a few months ago civilian doctors with no military training at all. And Mr. Stanley described the difference between civil and military medical practice by saying that a military doctor is responsible for that part of the care of the sick which in civilian life would be the responsibility of the patient's wife or mother. To remedy these difficulties one of the first things to do was to undertake "constant inspection." For the carrying out of this Mr. Stanley has appointed additional medical inspecting officers at area headquarters. As was said in the debate which followed, what is needed is men of tact and experience who will be able to smooth the way of the civilian doctor working amid the unaccustomed mechanisms of the military machine; and, as Mr. Stanley also observed, of commanding officers who have no technical knowledge and who do not appreciate the importance of the medical standpoint.

Mr. Stanley's report of epidemics was reassuring. Influenza and German measles were subsiding and the mortality-rate from influenzal pneumonia was only half what it was in the epidemic of January 1937. Cases of cerebrospinal fever had been "completely sporadic in character" and owing to improved drugs and early diagnosis the mortality-rate had fallen to eight or nine per cent. and it was probable that the peak incidence of the disease had passed.

The Army estimates ranged over a wide field but of course there were no sagas to sing as of the Navy or Air Force so that what the House got was a picture of a vast administrative machine. Mr. Hore-Belisha sat in on the debate but did not speak.

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The House was profoundly shocked by the murder of Sir Michael O'Dwyer who was well known to many of its members, and this outrage so near to the Palace of Westminster and involving the wounding of the Secretary of State for India and two other distin-

guished men added to that sense of mal-ease which is an undercurrent of so much in the war.

War temperature is rising, the Finnish peace with all its tragic meaning for that gallant people brings us a stage nearer to the deploying of great events and great armed forces. Meanwhile diplomacy is one of the chief weapons of conflict. The drive for production goes on, from the land, from the factories in this country and from the Dominions and countries overseas.

Hints of an extension of rationing given by Sir Samuel Hoare in the House have since then been attenuated by statements made to the press. But it is certain that more rationing will come and probably an extension of the restaurant habit, the canteen meal and the middle-day dinner for schools.

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During the week the Parliamentary Medical Committee heard an address from the Director-General of the Army Medical Service and a frank discussion of difficulties. Cases have been ventilated in the House of Commons in which soldiers are alleged to have died as the result of wrong treatment or diagnosis. But if these cases are looked at in proper perspective they form a very small proportion of the total cases. Nevertheless they do reinforce the case Mr. Oliver Stanley made out for more inspection of medical institutions and medical work and for a closer coördination of the work of the C.O. and the M.O. The two ought to work as a team and when they do there is a happy unit as well as an efficient one.

One day in the week we considered the credit of £700,000,000 and only the I.L.P. voted against it.

An important medical matter was announced by Mr. Stanley in reply to a question from Mr. Woodburn. There has been confusion about the issue of certificates to patients discharged after treatment of mental or what Mr. Stanley called "nervous complaints." Such cases have been issued with a certificate to the effect that they may be "dangerous." It is now being made the rule that such certificates are only to be given in cases definitely diagnosed as mental disease. Border-line mental deficients and men suffering from anxiety conditions or nervous complaints are not to be given certificates in this form. In cases where certificates have already been wrongly issued they are to be cancelled and the relatives of the men concerned are to be notified.

Great efforts are certainly being made to make administration humane as well as efficient and Mr. Stanley has already produced a favourable impression on the House.

Mr. Hore-Belisha did not take part in the War Office debate though he did intervene to urge a more active attitude towards Finland—it was not very effective.

FROM THE PRESS GALLERY

The Health of the Army

IN the House of Commons on March 12 Mr. OLIVER STANLEY, Secretary of State for War, made a statement on the health services of the Army. In describing his recent visit to the British Expeditionary Force, he said that when our medical authorities landed in France they were confronted with great difficulties. It had not been possible to make any arrangements, except on paper, before the war started. The French authorities gave us every help, but they had to consider their own requirements and we had, therefore, to make the best of what accommodation was available. In consequence the hospitals were of many different types. Some were in big buildings, hotels or casinos which had been taken over and which were being adapted as rapidly as possible to their new purpose. Some were in newly constructed huts, definitely designed for hospital use, while some were in hospital marquees awaiting replacement by huts. There, as elsewhere, the work had been considerably held up by the weather. The medical and nursing staffs had a difficult time creating order, not out of chaos but out of nothing, and the conditions had been on the whole a good deal more difficult for the staffs than for the patients. Yet invariably he found them to be cheerful, keen, full of ideas for development and improvement and obviously on top of their jobs.

PERSONNEL, ACCOMMODATION AND SUPPLIES

When last April the decision was taken to double the Territorial Army, the medical services were not doubled at the same time. The necessary expansion had taken place since the war broke out, and the result had been that nearly ninety per cent. of the medical officers now actually serving were, a few months ago, civilian doctors with no military training at all. That, of course, did not mean that they were not good doctors, but it did mean that they knew nothing of military administration, that they did not know how to get the things that they needed, and that they had to deal with many problems which the civilian doctor seldom had to worry about. The sort of responsibility for the care of the sick which in civilian life was not that of the doctor but of the wife or mother was in the Army the responsibility too of the medical officer.

In civilian life there was nothing between one's own bed and the hospital—if a person was mildly ill he stayed in his own bed, but if he was seriously ill he went to a hospital. But in Army life they needed something more, for a billet or a barrack-room was neither a suitable nor a comfortable place if a man was ill enough to feel wretched but not ill enough to go to a hospital. They had, therefore, to have an intermediate stage which took the form of small medical establishments of three, ten, fifteen or thirty beds according to requirements, called reception stations or medical posts. These had a good scale of equipment and were looked after by one or more medical officers with a staff of medical orderlies, but they were not hospitals; they had no microscope, no X rays and no laboratories. The instructions were that in general a man should not be kept in these reception stations for more than 48 hours, and that if he was likely to require longer time than that he should be sent to the nearest hospital. It was not always easy to find proper and suitable accommodation for these reception stations. Troops were put down in a particular area for tactical or training reasons, and the accommodation for a post had to be the best that could be found in the neighbourhood; it was not always very good. It was, however, in connexion with these reception stations that most of the criticisms on the medical arrangements of the Army had been received. Some of these criticisms, when examined, had no value. He was continually being sent "on unimpeachable authority" stories of so fantastic and baseless a character that he wondered from what type of mind they could originate. There have been stories of wholesale deaths of soldiers in a particular camp from a particular disease, when there had not been one case of that disease since the war began. That type of complaint was merely an irritating waste of time. But he had also received from many M.P.s some definite and specific criticism which had revealed conditions which needed remedying. The shortcomings had not been due to medical inefficiency, faulty medical treatment or a deficiency of drugs, but rather to unsatisfactory buildings, equipment or attention which had often caused the sick unnecessary hardship. These things were in process of being remedied. The first cure lay in constant inspection by an experienced medical officer. Additions had therefore been made to medical staff at area headquarters in order that officers might be released from office work to go out and see conditions for themselves. They had to remember that the responsibility for the care of the sick was not only that of the medical officer but also of the commanding officer of the unit. A commanding

officer might not have any technical knowledge. He might not know how to put a thing right, but if a thing was wrong it was his duty to kick up a row until the person who did know put it right. The attention of all commanding officers had been called to this fact. Further, he had not been satisfied that up till now the fullest advantage had been taken of the benefits which could accrue from a close understanding between the military medical authorities and the various voluntary bodies which had been wishing to coöperate with the troops. Instructions had now been sent out to all medical officers to get in touch with the local Red Cross and other leaders. With regard to drugs, medicines, and so on, there had never been any shortage in bulk, thanks to the foresight of the Army medical authorities who bought largely before the war. Wherever a shortage had been disclosed it had been due to distribution, and often to the fact that the medical officer had let his stock run too low before indenting for new supplies.

Summing up, Mr. Stanley said that the medical authorities had been faced with great problems due both to the expansion of the Army and to the location of troops in unaccustomed areas, that these difficulties had been aggravated by the severe weather and the accompanying epidemic of influenza and German measles, but that, on the whole, they had tackled them with energy and a great measure of success. Nevertheless, there had been much which could be improved, and they were determined to see that it was improved.

INFECTIOUS DISEASES

Mr. Stanley said that the health of the Army had been extremely good, apart from two epidemics. The first was the influenza epidemic, although he was told that he ought not to call it by that name. Apparently the medical authorities had established that there was no virus. It had, on the other hand, fever, pains and everything else which made 'flu for the ordinary man, and he would therefore go on calling it influenza. This epidemic began at the end of December and had a very heavy incidence during January, but began to drop off in the middle of February and was now much diminished. The influenza in itself had not been of a severe type, but naturally the fear was the development of pneumonia. The rate of admission to hospital per thousand was only slightly higher in January this year than it was last year, when there was no epidemic, while the rate of mortality from pneumonia was lower than it was in the five years 1932–36, and only half of that in the less widespread epidemic of January, 1937. That was a particularly satisfactory comparison, because if the allegations of neglect made against the Army medical services were correct the one place one would expect to find it reflected would be in the number of cases of influenza which developed into pneumonia.

The other epidemic, of German measles, had been extremely mild. Symptoms had usually lasted only two or three days, but it had created difficulties in accommodation because isolation was required.

There had also been some cases of cerebrospinal meningitis. These were sporadic in character, and had occurred in barracks, hired buildings, billets and huts. In only very few instances had there been any connexion between cases, or more than one case from the same barrack-room. Largely because of improved drugs and early diagnosis there had been a tremendous fall in the mortality-rate. During the last war the rate was 40 per cent. in the Army and 60 per cent. among civilians, while in particular areas it rose to as high as 80 per cent. On this occasion the rate had been between 8 and 9 per cent. In the last few weeks there had been a fall in the number of cases, which led him to hope that the peak of the disease was reached in the first week of February. The incidence of all other notifiable diseases had been considerably lower than it usually was in the Army in peace-time.

MEDICAL CRITICISM

In the discussion that followed Mr. Stanley's statement Sir HENRY MORRIS-JONES said that there was grave disquiet about the Army medical services. He objected particularly to the separation of Army treatment from that undertaken by the Ministry of Health. There was overlapping, which would continue until the Cabinet, or whoever was responsible, reviewed this whole question. He took it that the policy was adopted because of the possibility of air-raid casualties. He had taken the view for some time that there would be no bombing of this country at all, and we must consider whether we should keep ourselves prepared for bombing for an indefinite period at the expense of some of our vital services. It was impossible to get continuity of medical treatment in the Army with this dual service.

Dr. HADEN GUEST recalled that the cause of the tremendous typhoid epidemic in the South African War was failure on the part of the commanding officers concerned to take into account medical experience, knowledge and suggestions. Mr. Stanley had said that some of the difficulties which had arisen had been due to the fact that a large number of the medical officers were civilians and inexperienced in military matters. Mr. Stanley's remedy of constant inspection by and association with army medical officers would be valuable if these officers were not only experienced but also understanding. He hoped that this policy would be extended overseas. A good many commanding officers were not too expert, particularly in correlating their functions with those of the medical officers. It was very necessary that the commanding officer and the medical officer should get together. There should be definite suggestions for the duties of medical officers. It should be made part of the duty of a medical officer to see that the diet of the troops was properly balanced, and that there was a proper proportion of fresh food. Milk was a valuable ration, and it was interesting to note that in the daily ration of the Finnish army there were 2¼ pints of milk. The opinion of the medical officer should be sought on the question of the hours of work of the troops. The preventive rather than the curative aspect of medicine should be emphasised. The arrangements for the treatment of men in this country and overseas in and out of hospital, were more efficient in this war than ever before.

QUESTION TIME

Male Nurses

Mr. A. WOODBURN asked the Secretary of State for Scotland whether he was aware of the decisions of the General Board of Control in Scotland, under circular 255, not to allow male nurses, compulsorily transferred to other areas as a result of mental hospital evacuation, the additional board and lodgings thus necessitated and that only an allowance of 5*s.* was paid; and whether, in view of the hardship thus caused, he was prepared to take such steps as would ensure that the sacrifices asked of this class of worker were not of a punitive nature.—Mr. J. COLVILLE replied: The circular made a provisional recommendation to mental hospital authorities that the standard billeting allowance of 5*s.* a week should be granted to transferred married attendants towards expenditure incurred by them in obtaining lodgings. A recommendation made by the Joint Conciliation Committee for Scotland on which the Asylum Workers' Union is represented, that the allowance of 5*s.* should be increased is under consideration.

Mr. WOODBURN asked if Mr. Colville's attention had been called to the proposal of the Joint Conciliation Committee for Scotland to standardise a 54-hour week before overtime was paid to male nurses in mental hospitals, and in this way worsen the conditions of nurses with an established 48-hour week; and whether he would take steps to ensure that the circumstances of the war were not used to worsen the practices agreed to between trade unions and employers.—Mr. COLVILLE: I am not aware of any such proposal.

Enemy Aliens in Military Hospitals

Sir GIFFORD FOX asked the Secretary of State for War whether at the present time any enemy aliens were employed in military hospitals in this country; and

whether it was proposed to continue the practice indefinitely.—Mr. OLIVER STANLEY said: The answer to the first part of the question is in the negative; the second part, therefore, does not arise.

Sanitary Inspectors in the Army

Major J. MILNER asked the Secretary of State for War if he was aware of the dissatisfaction amongst qualified sanitary inspectors who had enlisted relying upon a circular from the Royal Sanitary Institute, based on War Office instructions which promised promotion, which instructions were afterwards changed; that many senior inspectors were employed on duties such as picking up paper and cleaning latrines; and whether orders would be issued altering this state of affairs and giving sanitary inspectors the ranks and duties for which their experience fitted them.—Mr. OLIVER STANLEY replied: The statement regarding promotion in the circular from the institute was based on a misconception of the information obtained from the War Office. The error in the circular was pointed out to the secretary of the institute as soon as the circular was received in the War Office. On the same day a correction was posted to every recruiting-centre in the country. The sanitary inspectors who enlisted under any misapprehension cannot therefore have been many, and it is probable that the great majority of suitable men have already been promoted to non-commisioned rank. Instructions have already been issued that sanitary inspectors are to be employed in accordance with their qualifications.

Field Hygiene Units

Major MILNER asked if the Minister was aware that mobile baths units, commanded by infantry officers, had been formed from various combatant corps, and attached to field hygiene sections, which were non-combatant; whether this was in accord with the Geneva Convention.—Mr. STANLEY: Mobile bath units are non-medical units which are attached to field hygiene sections for administrative convenience. The protection of the Geneva Convention is not claimed for them, and no infringement of the convention is involved. In reply to a further question Mr. STANLEY said that field hygiene units were not commanded by infantry or other officers, but by officers with medical qualifications.

LETTERS TO THE EDITOR

THE G.P. AND THE VOLUNTARY HOSPITAL

SIR,—Dr. Craig in his letter of Feb. 24 discussing the future of voluntary hospitals remarks, very truly, that "judging by the absence of any claims put forward the general practitioner seems to agree that he has no part in a hospital scheme." His solution of the problem as seen in its full breadth from the country sounds to a townsman both good and workable but, as it stands, would not much alter the relations between practitioner and hospital in London and there is no doubt that they need altering. It has always seemed to me hard to picture a state of affairs in which the whole body of London doctors—unless their numbers were much reduced or hospitals were greatly multiplied—could be given hospital beds or posts, and it may be because others share my difficulty that no claims are put forward at least from this town, but that does not mean that we have nothing to ask from the hospitals.

What I think we might fairly demand is that the voluntary hospitals—meaning their visiting and resident staffs, their secretaries and their committees of management—should try much harder than they do to recognise our existence, to learn and understand our point of view, to give us such honour as we may deserve, to encourage us in good work, and above all to coöperate with us in the investigation and treatment of patients. Let it be said at once that all these good things can be had by making personal contact with chosen members of visiting staffs, but this is often impossible and surely should not be necessary. The sad fact is that hospitals, if approached impersonally (i.e. if the patient be directed to the physician or surgeon on duty), and still more if our patients go up "on their own," often seem unable to imagine any middle course between taking our patients from us and making them their own or rejecting them with contempt. The first course is the traditional reaction to "a good case," the second to "a snag." The genius loci of the voluntary hospital seems unable to understand that we may really want to use his institution as a consultant, that we may be neither morons nor born idlers, but good doctors in a difficulty needing some specific help in the diagnosis, treatment or management of a patient for whom we by no means wish to disclaim responsibility.

These may seem hard words but they are founded on the repeated experiences of twenty years of practice and dealings with many hospitals and the well-known fact that hospitals have sad tales to tell of general practitioners has never seemed to me to square matters. *Noblesse oblige*, and the voluntary hospitals are very proud of their lineage. Surely they should behave like the consultant worthy that name, not like the quasi-consultant, careful not to ask whether the patient has a doctor. The fault arises partly, I think, because so very few of the staff, either old or young, have ever tasted general practice and from that not ignoble tradition by which every member of a great hospital regards it as a kind of sacred city without which is darkness impenetrable to the imagination, but partly also from newer influences emanating from secretaries and boards of management.

Not long ago the voluntary hospitals received alms of the charitable rich and with their help gave free treatment to the sick poor. This was simple. There was no doubt in any mind what hospitals were for, but now it must be doubted whether their first object is to give treatment to those who cannot get it without them or whether it is not rather to expand, just as a big business, though pleased to serve its customers, exists at heart to grow. The hospital wants to get bigger, richer, fuller of shiny gadgets, more glorious than its neighbours, and the needs of patients, instead of being the end-all of the whole business, become a thing necessary to expansion. A serious reduction in the number of patients, such as would occur if all those who ought to go back to their doctors were sent back, would be, from this point of view, deplorable. The great hospital might actually shrink.

It is therefore very doubtful whether there is any real desire within the hospitals to relieve what Dr. Craig calls "the congestion that is slowly choking them"; there is no public rejoicing over *diminished* outpatient attendances or waiting-lists and a voice whispers to the young doctor, wondering whether to discharge the hospital patient to his own practitioner or to invite his reattendance in a fortnight, "If thou let this man go thou art not Cæsar's friend"—he listens and writes "rep. mist." This is where the municipal hospital has a real advantage. It is not concerned to advertise itself or to pitch a tale of woe, and it does its work with a becoming modesty.

I am at heart an individualist, I have had my full share of affection for the voluntary hospitals, but I should still deplore an all-embracing state medical service, believing that we would sell our professional freedom for a mess of potage and that our patients would lose the inestimable advantage not so much of "free

choice," but of "one man, one doctor"; and I have candidly to confess that it is to a municipal hospital that I now habitually turn as to a friend in need. True, the Emergency Bed Service has made the voluntary hospitals a little less difficult of approach, but it is the municipal hospital which receives my patients without dispute or delay, sends an ambulance for them if need be, welcomes me to its wards to visit them at almost any hour, invited me lately to assist at an operation on an "emergency" I had sent in, and which invariably returns my patients to me on discharge with the kind of report I want to have.

I am, Sir, yours faithfully,

London. LINDSEY W. BATTEN.

MINERS' NYSTAGMUS

SIR,—I feel that the article on miners' nystagmus by a clinical psychologist in your issue of March 9th should not be allowed to pass without comment, for it contains several assertions which seem to be contrary to facts. Most observers agree that the oscillations of the eyes is just one amongst many of the signs and symptoms of miners' nystagmus. Amongst the latter are those general nervous and mental symptoms which may be termed psychoneurotic, though that term does not elucidate their origin. It seems illogical to assert that because the various nervous and mental symptoms which are present in miners' nystagmus can be found in other conditions, therefore miners' nystagmus is a pure psychoneurosis. It would be as logical to say that bronchitis, pneumonia, pleural effusion, heart disease or severe anæmia are all one and the same disease, because all are associated with the same prominent symptom—shortness of breath. Again the increase or appearance of other nervous symptoms as the oscillations disappear is by no means a common phenomenon.

There is a definite *disease* to which coalminers are liable, and one of its outstanding symptoms is a characteristic type of oscillation of the eyeballs. It is commonly accompanied by other symptoms both nervous and mental. To rename the disease a psychoneurosis does not lead anywhere. It merely stresses a group of symptoms under a grandiloquent nomenclature, and in no way advances our knowledge as to the cause of the disease.

During the past 15 years or more the lighting in coal mines has been vastly improved by the substitution of electric lamps for the old safety oil lamps. Yet there has been no decrease in the incidence of the disease. Surely this should have thrown some doubt on the validity of the theory that defective lighting was the effective cause of miners' nystagmus? For many years the postural theory held the field as the cause, and only after a long period of heated discussion was it ousted by the advocates of the theory of defective lighting. This idea is now so deeply entrenched that it will take another long period before we get out of this blind alley.

Some of us feel that the true cause ultimately will be found to be a form of chronic poisoning, a toxæmia, either gaseous or bacterial. The mere fact that no such poison has yet been discovered is no proof that there is no none. Considerations of space prevents the elaboration of the arguments. One interesting comparison may be made. Take such a disease as G.P.I. due to a chronic infection. In some of these cases the most prominent features are the physical, tremor of the tongue and lips and so on. In others the mental symptoms are the outstanding features. So in miners' nystagmus we may see cases in which oscillations are marked, while the nervous symptoms are but little in evidence; others again show but very slight oscillations, and often only after strain, but the nervous symptoms are pronounced.

For the present it is far better to retain the old name than to adopt a new nomenclature with a very doubtful hypothesis to support it.

I cannot agree that there is any real analogy between the nystagmus seen in coalminers and that which occurs in crane workers and train dispatchers, though I have not hitherto heard of these types of cases. The conditions of work are so entirely different. I am, Sir, yours faithfully,

Cardiff. D. LEIGHTON DAVIES.

RISKS OF ŒSTROGENS

SIR,—In your leading article of March 9 you refer to the decision of the Council on Pharmacy and Chemistry in America not to recognise the synthetic compound diethylstilbœstrol for general use until further experimental studies have been undertaken. It seems to me that the reasons you set forth as grounds for the general distribution of the drug in this country merit some criticism.

You state that there seems to be no conclusive evidence that carcinoma has followed prolonged œstrogen administration. How could conclusive evidence of this nature be obtained? Carcinogenic agents do not immediately produce cancer. The initial stage is a hyperplasia of sensitive tissue after which a long time elapses before cancer is induced. This period Lacassagne found in laboratory mice represented a span of the life of a mouse which corresponds, as I pointed out in my letter in THE LANCET, 1936, **2**, 1431, to seven to ten years in man, and during this latent period administration of the drug had been discontinued. How could a general surgeon to whom cases of mammary cancer are usually referred be expected to link this condition with a medicine prescribed for some gynæcological condition seven to ten years previously?

The practical difficulty of correlating cause with effect in relation to the remote effects of œstrogens in man has I think concealed the risks of these preparations and led to their fearless, widespread and intensive administration. In addition, the fact that their administration is not demonstrably attended by toxic effects tends to be accepted as "evidence that no permanent damage has been caused." Of what value is such evidence in regard to drugs which have a selective effect on certain tisues, an effect which cannot be demonstrated clinically but which requires post-mortem or protracted study of the tissues?

With regard to the immediate toxic effect of stilbœstrol the following case which has recently been under my care merits report, since the "side effects" can scarcely be described as merely "unpleasant." Stilbœstrol was prescribed for a married woman aged 45, who complained of a lump in her breast. She reacted to the drug by developing a lump in the other breast. Then she observed the loss of her axillary and pubic hair, and after this a skin eruption developed. When seen she had extensive areas of severe exfoliative dermatitis with pyrexia. Apart from the incidence of exfoliative dermatitis following the administration of stilbœstrol in this case the selective effects of the drug on the hair follicles of the axillæ and pubis is of particular interest. This hair develops at puberty and is associated with the growth and development of the generative organs. There is only one other drug known to be toxic to hair follicles, namely thallium acetate, which affects the hair of the scalp and eyebrows. The disastrous effects of this drug on young adults has been recorded in more than one instance.

With regard to the statement that "manufacturers have sold many kilogrammes of stilbœstrol representing some millions of doses and most of them have had no complaint at all," it seems pertinent to ask since when have the manufacturers of drugs become recognised as a clearing house for the clinical records of the effects of their preparations? My personal experience of reporting to a manufacturer regarding a substance, the deleterious effects of which I had observed in a large number of cases, was a refusal by the company's chemist (who had called on me) to make any alteration, and the request that I should not condemn the product because it would affect the sales.

I am, Sir, your faithfully,

Welbeck Street, W.1. ELIZABETH HUNT.

CONSULTANT ADVISERS TO THE E.M.S.

SIR,—I have been expecting an answer in your columns from Dr. Anderson to two questions I put to him in my letter in your issue of Feb. 17. As he had described himself as the proper, if not the sole, authority to be consulted for the elucidation of facts regarding the E.M.S. it is surprising that he should not, when approached, give me the answers I asked for. These dealt with (1) his own position on the Advisory E.M.S. Committee, for which he spoke with such confident assurance and such complete absence of reticence. I sit on many committees and am chairman of several. I find it remarkable that a paid official, not a member of the committee, should thus divulge its proceedings in the press without incurring disciplinary correction; (2) the composition of the committee mentioned by him as having been primarily responsible for the advice tendered to the Minister of Health in July last by the Central Medical War Committee "on the terms of service, part-time and full-time" in the E.M.S. I am able now, from other sources, to identify this committee with the body cited by the Minister in a Parliamentary answer as "a committee under the chairmanship of Sir Charles Wilson" and it is clear, both from Dr. Anderson's statement and the Minister's reply, that the principal responsibility for the measures taken in the first instance must be given to this committee and perhaps a secondary share to the Central Medical War Committee.

These measures have been described with some severity, but I think with essential justice in the memorable posthumous article by Wilfred Trotter written I understand in November last but not published until February (*Brit. med. J.*, Feb. 17, 1940, p. 270) as resulting in "medical practice half paralysed and medical education wholly disorganised . . . the great hospitals three-quarters empty" and his summing up was "decisions bearing the diagnostic marks of having been affected by panic should be reviewed without mercy or any regard for the saving of face." It is sad to reflect that no effective mitigation of these calamitous measures was in fact achieved until December, three months after the outbreak of war. It was comforting to hear from the present Minister of War last week in Parliament (*Hansard*, p. 1501) that that department also has qualms as to the wisdom of some of these measures as they affect the Army and is engaged in correcting them.

In your issue of Feb. 17 you printed an answer by the Minister of Health giving the rates of pay of the consultant advisers of the Emergency Hospital Scheme, appointed in July last. Four prominent members of the Scottish medical profession were mentioned by the Minister as receiving full-time or part-time salaries. A repudiation of this statement is published in a letter[1] in the *Scotsman* of March 14. Our Scottish fellow-countrymen are often, very unjustly, reproached with a certain fondness for "saxpences." It is surely somewhat remarkable that their English colleagues should not also have been allowed to make their contribution voluntary.

As the Minister has found himself obliged to refuse the request (*Lancet*, Feb. 3, 1940, p. 245) for part-time service, made from many quarters on behalf of certain much less well-paid members of the E.M.S. and supported by the Advisory E.M.S. Committee itself, this earlier lavish expenditure (*Lancet*, 1939, **2**, 1293) should, I submit, be revised at the earliest opportunity.

I am, Sir, yours faithfully,

House of Commons. E. GRAHAM-LITTLE.

A VOLUNTARY CONTRIBUTION TO THE WAR EFFORT

SIR,—Our attention has been drawn to the publication in the press recently of the reply given by Mr. Elliot, Minister of Health, to a question asked in Parliament by Sir Ernest Graham-Little. Sir Ernest asked for information of the names of the consultant advisers to the Emergency Hospital Service and for details of their salaries and appointments. In his reply Mr. Elliot said that seven of the consultant advisers were on a whole-time basis and the remainder on a part-time basis at proportionate salaries. In the press notice there then followed a list of the names of the consultant advisers for England, Wales and Scotland.

When we were invited a year ago by the Secretary of State for Scotland to act as consultant advisers to the department on emergency hospital services in wartime, we were offered no salary and expected none. Our services were offered as a voluntary contribution to the War effort. We feel it is only right that the above facts should be publicly stated in order that any misconception engendered by the reported reply of the Minister of Health to Sir Ernest Graham-Little may be removed.

We are, Sir, yours faithfully,

JOHN FRASER,
Regius Professor of Clinical Surgery, Edinburgh University;

R. W. JOHNSTONE,
Professor of Midwifery and Gynæcology, Edinburgh University;

STANLEY DAVIDSON,
Professor of Medicine, Edinburgh University;

J. H. MACDONALD,
Medical Superintendent, Hawkhead Hospital, Glasgow.

WOUND SHOCK AND SUPRARENAL CORTEX

SIR,—I believe a discussion on the relation of wound shock to the suprarenal cortex might be of use at present. The words of W. C. Wilson and his colleagues seem to apply also to wound shock. In what was, I think, the first paper on the treatment of burns with cortical extract they referred to the (supposed) lack of chemical and pathological evidence to support the treatment and wrote[2]: "indeed we were so influenced by the absence of this evidence that we postponed the trial of the cortical extract in acute toxæmia for several years." E. M. Cowell[3] recognised four factors as being concerned in the causation of wound shock—pain, loss of heat (chill),

1. A similar letter from the consultant Scottish advisers follows. —ED. L.
2. Wilson, W. C., Rowley, G. D. and Gray, N. A. *Lancet*, 1936, **1**, 1400.
3. Cowell, E. M. *Ibid*, 1939, **1**, 228.

bleeding and toxæmia. He quotes McDowell who found the suprarenals are exhausted by cold. He concludes that although from the experimental point of view toxæmia is not yet accepted as a cause of shock, yet clinically it seems to be an important factor.

Although, as Dale and Laidlaw [4] have pointed out, there is a close resemblance between histamine shock and the shock produced by muscle trauma, in wound shock unfortunately "direct methods have failed to demonstrate a depressor (shock-causing) substance in the blood of a shocked animal" (Smith [5]). In burns, however, direct proof was also lacking. In histamine shock, anyway, an increased demand on the suprarenals seems to be recognised (see Wilson). Bleeding into tissues or the intestines, I suggest, probably acts through its "foreign" (because denatured) protein somehow like peptone, giving rise to an antigen-antibody reaction, and thus also exhausts the adrenals.

Selye [6] in Toronto found hyperplasia of the adrenal cortex in animals dying of surgical shock. He called it the "alarm-reaction" of the adrenals.

But there are more elementary relations between cell-injury and the adrenals. One of the cardinal features of cell-injury is the interference with "selective permeability," manifesting itself by loss of intracellular potassium and phosphate and the entry of the antagonistic sodium-chloride group into the injured cell, and by loss of electric potential (Keller and co-workers [7]). This occurs under the influence of histamine, narcotics, direct cell-injury (burns), oxygen-deficiency, loss of heat, exertion, and so on (Dale, Eppinger's "seröse Entzündung"). In all these conditions cortical extract was able to reduce the disturbances of selective permeability (Kaunitz, Kaunitz and Selzer [9]). As Einhauser [10] puts it, the cardinal function of the adrenal cortex appears to be its influence on the body cells in resisting the differences in osmotic concentration. Cortical insufficiency causes loss of cell-potassium and the passage of the antagonistic group into the cell, and leads to cell-injury. Salt deficiency aggravates Addison's disease. Primary loss of salt (McCance [11]) may lead to a pronounced picture of cortical insufficiency. Not only loss of salt outwards but also loss into the injured cells, as Haden and Orr suggested for hypochloræmic azotæmia, seems to act in the same direction. In traumatic shock we can imagine a wandering of sodium chloride into all cells that are indirectly injured, especially in the traumatised tissue. Any kind of cell-injury associated with these electrolyte movements causes a relative cortical insufficiency, and may, if counter-mechanisms are not effective, finally lead by a vicious circle to fatal derangement of metabolism and the circulation.

There is then, I think, a case for the administration of cortical extract (or an active synthetic substance) in wound shock. It has been suggested already and I have seen its effect in a small number of cases. Similarly a state of cortical insufficiency apparently exists in some cases of gas poisoning (Yperite, Pyrodin, Lysocin, &c.).

I am, Sir, yours faithfully,

Queen's Drive, N.4. H. POLLAK.

4. Dale, H. and Laidlaw, P. *J. Physiol.* 1918, **52**, 355.
5. *J. Pharmacol.* 1927–28, **32**, 465.
6. Selye, H. *Klin. Wschr.* 1938, **17**, 666.
7. Keller, R. *Ibid*, 1934, **13**, 1041.
8. Kaunitz, H. *Z. klin. Med.* 1938, **134**, 224.
9. Kaunitz and Selzer, L. *Z. ges. exp. Med.* 1938, **103**, 664.
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11. McCance, R. A. *Lancet*, 1936, **1**, 823.

FRACTURED FEMUR IN CONVULSION THERAPY

SIR,—In the article on fractures of the neck of the femur in convulsion therapy by Mr. Gissane, Dr. Blair and Mr. Rank in your issue of March 9, I was particularly interested in the first of their five conclusions based on 4 such fractures (the eldest patient being aged 41) in a series of 96 cases. "Convulsion therapy," they say, "should not be used in elderly patients or in those who have had prolonged periods of inactivity, because the bones of such people have atrophied from disuse and readily fracture." I venture to disagree with that conclusion on several points.

I have now treated over 160 cases with Cardiazol and in these there have been but 2 fractures, 1 of them reported elsewhere (*Brit. med. J.* 1939, **2**). Of a recent series of over 80 cases that I have treated, 25 fell within the age-group 50–65 years, composed as follows: 50–55 years, 13 cases; 55–60 years, 8 cases; 60–65 years, 4 cases. In only one of these, a woman of 59, did a fracture occur—of the head of the left humerus. Most of the 25 cases between 50 and 65 had "prolonged periods of inactivity." Indeed, some of them had been practically bed-ridden for years. I think these facts speak for themselves.

I also disagree with two other points in their article—namely, "that the intensity of the muscular contractions during these convulsions is the most important factor in the causation of the fractures"; and that the fit of cardiazol convulsion and that of idiopathic epilepsy "differ greatly in the intensity of the muscular contractions." From the study of the convulsions produced in approximately 3000 injections, the ætiology of cardiazol fractures to my mind is not the intensity of the muscular contractions acting on the alleged brittleness of bones in the elderly or in those who have had long periods of inactivity. The fractures appear to be due in most cases to the technique adopted during treatment. Details of the activities of the doctor and nurses before and while the patient is convulsing are usually lacking, but one gathers from reading different papers that such activities are directed towards restraining the movements of the patient. This, in my opinion, is a definite mistake; the behaviour of the doctor and nurses during that period should be one of complete inactivity save for guarding against dislocation of the jaw. Any movement of the patient during that period (save the jaw movement) should be quite unrestrained, and it is by acting on that maxim that I believe the number of fractures in my series of cases have numbered no more than 2. The maxim was arrived at by considering the difference in incidence of fractures in cardiazol therapy and in idiopathic epilepsy. Since I could see no difference in the intensity of the muscular contractions in the two types of convulsion, I concluded that fractures in idiopathic epilepsy are rare because in them there is seldom either opportunity or occasion for restraint—the convulsion is regarded as a matter of course and the various parts of the body are allowed to look after themselves, which they seem to do very successfully. This hypothesis was borne out in the lady of 59. Her fracture occurred most probably as the result of restraint exerted on the affected region by a nurse who was new to cardiazol treatment. It is perhaps superfluous to recall how a limb in the tonic stage is no longer a limb in the ordinary sense of the term; it loses its flexibility and range of movement and becomes a rigid structure unyielding save to considerable external force. It is easy to see how a fracture can occur when to the muscle strains on the bone already present external restraint is added.

I have found cardiazol therapy very safe at all ages and in the most diverse physical states, both abnormal and normal, and I think it would be a pity if someone were to be prevented from employing it in the elderly or in those who have been inactive for a long period by the article referred to. The categorical statement that in my experience (and I think I have adduced enough facts to support it) age or prolonged inactivity bear no relation to the incidence of fractures may, I hope, have the necessary corrective effect.

I am, Sir, yours faithfully,

RANKINE GOOD,

Assistant Medical Officer, Glasgow Royal Mental Hospital.

CONTROL OF WOUND INFECTION

SIR,—The paper by Mr. Fuller and Major James on p. 487 of your last issue has left me with the uneasy feeling that in our enthusiasm for this new panacea we may forget or neglect older and proved preventive measures. If *Str. pyogenes* is to be the great enemy of the wounded in this war as it apparently was in the last, the surgeon and the medical orderly should be encouraged to follow the example of the obstetrician and the midwife, just as the latter have for the past decade or two been exhorted to emulate the surgeon. The mask and glove have proved their worth in the prevention of streptococcal puerperal infection in domiciliary practice, and their use together with isolation of the septic case has reduced streptococcal infection to a minimum in well-conducted maternity institutions. If for domiciliary practice we substitute the regimental aid post and the casualty clearing station, and for maternity institution the base hospital, these methods in conjunction with surgical prophylaxis should accomplish much in the prevention of streptococcal infection of wounds. At the base hospitals, where the risk of infection is greatest, large wards should be subdivided into smaller units, and there should be ample isolation accommodation so that patients already infected may be nursed separately from "clean" cases.

Experience teaches that when a ward is overloaded with infected cases due to one species of micro-organism—e.g., *Str. pyogenes*—the ordinary precautionary measures to prevent the spread of infection are unavailing, and to put the onus on the nursing staff is unjustifiable. With an enforced blackout and poor ventilation air-borne infection becomes increasingly important and attention should be directed to methods for the prevention and cure of infected atmospheres. A bacteriological control is also essential, the more so as the sulphonamides—if our analogy with puerperal sepsis holds good—may mask but not eliminate the streptococcal invader.

I do not wish to minimise the probably great usefulness of chemoprophylaxis in streptococcal infection of wounds, but, as I foresee difficulties in giving the prescribed prophylactic course under field conditions, I feel that the indiscriminate use of these drugs should not displace general preventive measures. Further, the clinician seems to be less enthusiastic about the free use of sulphonamides than is the laboratory worker whose mice cannot tell of the depressant and other toxic effects of the drug.

As for gas gangrene, it may well be that a combination of surgical, antitoxic and chemical prophylaxis will be required to deal with this rapidly progressive and highly fatal infection.

I am, Sir, yours faithfully,

London, N.W.3. R. CRUICKSHANK.

LIPOCAIC

SIR,—In the annotation on lipocaic in your issue of March 2 I was interested to see the statement that Dragstedt and his collaborators have been able to extract an active preparation from pancreatic glands in which almost the whole of the acinar tissue had degenerated as a consequence of ligation of the pancreatic duct. I have closely followed Dragstedt's work, but have failed to find a paper in which this specific observation—a matter of some practical difficulty—has been recorded. I am familiar with the observation of Dragstedt and his colleagues that dogs in which the pancreatic duct is tied and in which the acinar tissue of the pancreas has largely degenerated do not die with fatty infiltration of the liver; but this observation does not cover the statement that lipocaic has been prepared from such degenerated pancreatic tissue.

I am, Sir, yours faithfully,

F. G. YOUNG.

National Institute for Medical Research, Hampstead, N.W.3.

*** The statement to which Dr. Young has drawn attention has not as yet appeared in print and was made during an informal discussion at the meeting of American Physicians held at Atlantic City last May.—ED. L.

THE PULMONARY CIRCULATION

SIR,—In his interesting article in THE LANCET of Jan. 6, Dr. R. A. Young devotes a paragraph to a predecessor of Servetus, the Arabian scholar and physician Ibn-an-Nafis. The bibliography there does not mention the important contributions to this subject by Dr. M. Meyerhof of Cairo, who summarised a previous work of his in *Isis*, 1935, **23**, 100. Here, on p. 116, will be found a better translation of the important Arabic passage than that quoted by Dr. Young, and the same article will also serve to establish the following points: the book of Ibn-an-Nafis in which he exposes his theory is not a religious work but a commentary on the anatomy in the Canon of Avicenna; the author himself was not a heretic but an orthodox Mohammedan scholar; his assertion that he did not perform dissection must be accepted, and his practical directions are simply taken over from Galen; finally, Dr. Meyerhof comes to the conclusion that Servetus, notwithstanding some astonishing coincidences, cannot have been influenced by the work of Ibn-an-Nafis.

I am, Sir, yours faithfully,

JOSEPH SCHACHT.

London, W.C.1.

SUGAR IN MEDICINE

SIR,—When the sugar-rationing scheme was announced recently all those concerned were gratified to learn that the position so far as the use of sugar in medicine was concerned remained unaffected. This pleasing news was, however, accompanied by an indication that every opportunity should be taken to reduce voluntarily the quantity of sugar for medical purposes in order that a substantial contribution might be made to the general reduction in sugar usage which it was necessary to effect. Such a contribution would not only assist in conserving the resources of the country but might also avoid a compulsory reduction at a later stage. If compulsion is applied there may well arise the question of alternative formulæ for sugar-containing preparations in the British Pharmacopœia and the British Pharmaceutical Codex.

Those who remember the efforts that were made during the last war to meet the sugar shortage by such formulæ will realise how difficult it is to provide satisfactory substitutes for sugar. Sugar is not only a sweetening agent, it has also thickening and preservative properties, and it is only when attempting to provide substitutes for its use in medicine that its value is fully appreciated. No-one wishes to see a return to the use of the unsatisfactory substitutes which were employed during the last war and it rests primarily with medical practitioners to prevent such a contingency by limiting their prescribing of sugar-containing preparations to those cases where it is essential in the interests of efficient treatment.

Pharmacists are being urged to play their part in bringing about a reduction in the use of sugar in medicines, but so far as prescribed medicines are concerned they are in the hands of the medical practitioners in doing so.

I am, Sir, yours faithfully,

WALTER DEACON,
President, Pharmaceutical Society of Great Britain.

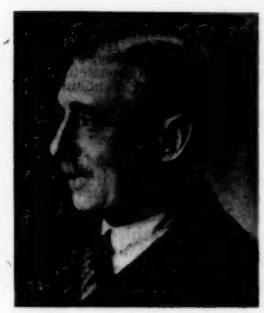
London, W.C.1.

OBITUARY

ARTHUR JOHN RUSHTON O'BRIEN

C.M.G., M.C., M.B. EDIN., M.R.C.P.

THE death of Dr. A. J. R. O'Brien at the age of 56 has deprived the Colonial Medical Service of a staunch friend and chief, while the Colonial Office has lost a wise counsellor at a time when he could ill be spared.



Elliott & Fry

O'Brien was born at Coalbrookdale in Shropshire, the son of the late William O'Brien of Clare. He graduated M.B. at Edinburgh University in 1905. Already he had a bent towards public health and forensic medicine, and in 1909 he took his D.P.H. and B.Hy. at Durham. But he did not neglect the clinical side of medicine and one of the house appointments he held was at the old Albert Dock Hospital under the late Sir Patrick Manson. He would often refer with pride to the days when he sat at the feet of the "father of tropical medicine." In 1911 he was appointed to the West African Medical Staff and served on the Gold Coast till 1915 when he went to the Cameroons on military service. He was mentioned in despatches and received the M.C. with bar. It is a rare thing for a medical man to establish himself as a first-class surgeon when well set in years but O'Brien was versatile to an unexpected degree and when in 1917 he was so severely wounded in the leg that his normal activities were limited he took up surgery. In 1921 he was appointed a surgical specialist in the service and two years later took charge of the Gold Coast Hospital at Accra. When he retired in 1929 he was awarded the C.M.G. He also took with him the respect and gratitude of Europeans and natives alike. In 1930 he paid an official visit to the West Indies to advise upon public-health questions and on his return he was appointed medical secretary to the Colonial Advisory Medical and Sanitary Committee. In 1933 his appointment became that of assistant medical adviser in the Colonial Office, and on the death of Sir Thomas Stanton in 1938 he succeeded him as chief medical adviser. That year, at the end of a strenuous tour of the East African territories, he was involved in an aeroplane crash and the effects remained with him during the long and trying winter which followed, when he had to grapple with the problems raised by colonial development and threat of war at home. Six weeks ago he took influenza and though he came back to work for a short time it was only to return to hospital, for trouble flared up once more in his old war injury. He seemed to be mending slowly but had an unexpected relapse.

O'Brien knew most of the members of the Colonial Medical Service personally and many people home on leave used to come and see him. He valued these contacts and his visitors went back to their jobs at the other end of the earth feeling that at home they had at least one person who knew their point of view and the nature of their task. Shrewd and well-balanced in his judgments, he was always loth to express decisive views on controversial subjects, but his well-founded convictions were based upon extensive reading and he showed a broad and statesmanlike outlook in handling colonial affairs. He was a sympathetic and efficient chairman at committees, and he was as fine a man to work for as to work with. He said what he meant, he was just and sincere—as everyone said, "We all know exactly where we are with O'Brien."

He married Katherine, daughter of John Aikman, of Edinburgh, and they had one son.

SIDNEY FREDERICK BARBER

M.R.C.S

THE death of Sidney Barber ends a somewhat lengthy association between his family and Sheffield medical circles, for he was the youngest son of the late Jonathan Barber who was surgeon to the General Infirmary in the middle part of last century. After his student days in Sheffield and at St. Bartholomew's he held resident posts at the Beckett Hospital, Barnsley, and later at the Jessop Hospital for Women, Sheffield. About forty years ago he settled down in general practice in Sheffield, where he continued in active work up to within a few days of his short fatal illness. Of a somewhat modest and retiring nature he took no very active part in public affairs either medical or general, but during the last war he served for a long time in France as a major in the R.A.M.C.

S. HORACE LAW

M.D. DUBL., F.R.C.S.I.

THE death occurred on Feb. 27 in his sixty-seventh year of Mr. S. Horace Law, for forty years surgeon to the throat, nose and ear department of the Adelaide Hospital, Dublin. He was the eldest son of the late Mr. T. Pakenham Law, K.C., of Carlow. Educated at Trinity College, Dublin, he obtained his medical degrees in 1896, and proceeded to the M.D. degree in the same year. He became a fellow of the Royal College of Surgeons in Ireland in 1900. After holding the Hudson scholarship and a resident appointment in the Adelaide Hospital he studied throat and ear work in Vienna, and returned to practise that specialty

in Dublin. At that time there was only one other strict specialist in that branch of surgery and Law speedily developed an extensive practice. He held his appointment at the Adelaide Hospital until his death, but ill health had lately hampered his activity. He was also consulting laryngologist to the Mercer's Hospital, Dublin. In 1917 he joined the staff of the 83rd (Dublin) General Hospital at Boulogne. While there he worked as a general surgeon, and impressed some of his colleagues by his sound knowledge of general surgery and his capacity to accommodate himself to an unfamiliar line of practice. He held the temporary rank of major in the Royal Army Medical Corps. Much of his leisure time was given to the pastime of yachting.

He married Sybil Mary, daughter of Sir George Clay, and there were three sons and one daughter of the marriage.

NORMAN PORRITT

M.R.C.S.

Dr. Porritt, who has died at Llandudno at the age of 82, was a versatile man. For 21 years he was surgeon to the Royal Infirmary at Huddersfield, playing a large part in local medical politics. During this time he had put his observation of local habits and customs into a popular story, he had studied the freedom of Jews from cancer, and he had done much to popularise shorthand among various classes of the population. He had also taken the Fothergillian medal of the Medical Society of London for a thesis on the operative treatment of intrathoracic effusion. When his increasing deafness led him to retire from practice in Huddersfield, he went to Bettws-y-Coed where he worked as a consulting surgeon and developed his gift for popular writing, chiefly in the form of topical paragraphs and short stories. "The Factory King" was based on the life and work of Richard Oastler, Huddersfield's first social reformer, and a clinical study on child-bearing gained him the Sir Charles Hastings prize. Later on he left Bettws for Penrhyn Bay and to the end of his life his active mind was never allowed to rest. He was twice married and had a son who is in practice at Penzance.

HENRY ROBERT OSWALD

M.D. EDIN.

Dr. Oswald, the former coroner for West London, died on March 11 at the age of 79. In his thirty years' service he gained wide and interesting experience which he summarised in a book of memoirs published in 1936. He held between 20,000 and 30,000 inquests, some of which were connected with events which have passed into history—the trials of Ronald True and Jacoby, the Westminster floods. He was born in Trichinopoly, Madras, the eldest son of Surgeon-General H. R. Oswald, of the Indian Army. After leaving the Royal High School, Edinburgh, he studied for the Indian Civil Service, but decided instead to take up medicine. Entering Edinburgh University, he obtained his qualifying degree in 1875 and his doctorate in 1881. After practising medicine for ten years he read for the bar and was called by the Middle Temple in 1894. Following a few years at the common law and criminal bar he became deputy-coroner for the central and western districts of the County of London, under Dr. Danford Thomas and Mr. Luxmoore Drew. He was also deputy for the south-western district and that of Kingston-upon-Thames and in 1902 he was made coroner for the south-eastern district. In 1919 he was transferred to the western district where he sat until his retirement in 1930. He was president of the Coroners' Society in 1922 and an active and valuable member of the Medico-Legal Society. As his "Memoirs of a London County Coroner" showed, his sturdy character fitted perfectly within the frame of the traditional Victorian outlook, with its virtues of straightforwardness, justice, great industry and loyalty to church and state. He was perhaps almost the perfect embodiment of the morality of a great and almost vanished age, with all its merits and defects. With his death the system of capital punishment loses one of its staunchest upholders.

Medical News

University of Cambridge

The following examiners have been appointed for the natural sciences tripos for 1940: *zoology*, Prof. H. G. Cannon, F.R.S., and Mr. W. H. Thorpe, Ph.D.; *physiology*, Prof. E. D. Adrian, Mr. F. J. W. Roughton, Ph.D., and Prof. B. A. McSwiney; *pathology*, Mr. R. Williamson and Prof. James McIntosh; *anatomy*, Prof. H. A. Harris, Dr. D. V. Davies, and Prof. A. Durward.

University of Dublin

On March 13 at the school of physic, Trinity College, the following degrees were conferred:

M.D.—R. E. Hemphill, and Cecil Mushatt.
M.B., B.Ch., B.A.O.—David Aiken, H. H. Balch, L. H. Bamber, Patricia D. Concannon, W. B. Denneby, Olive S. H. Devlin, Annie Dowds, Samuel Fine, R. R. Hogg, H. F. Kamp, Einhart Kawerau, P. F. Longford, R. F. G. Lyons, J. R. A. Martin, M. N. O'Riordan, F. J. Queally, F. H. Rubenstein, Tom Shier, Isidore Shreider, H. J. Smith, Samuel Tennenbaum, and R. J. S. Wilson.
L.Med. & c.—W. M. Winn.

War Posts for Women

The following appointments have been made: Dr. Josephine O. McDonagh, Dr. Margaret I. Morgan, Dr. Elsie J. Parry, Dr. Faith Poles, and Dr. Brenda Winterton, medical officers R.A.M.C., with relative rank of lieutenant; Dr. Winifred Brinckman and Dr. Kathleen Slaney, part-time civilian medical practitioners, Southern Command; Dr. Dorothy Lewis, assistant medical officer at the emergency public health laboratory, Technical College, Lincoln; Dr. Genevieve Rewcastle, medical superintendent of the W.R.N.S., with the relative rank of surgeon commander; Dr. Dorothy Fenwick, Dr. Dorothy Mann Adams, and Dr. Eleanor M. Gelling, medical officers R.A.F. medical department, with relative rank of flying officer.

Royal Society

The following have been elected to the fellowship of the society: W. T. Astbury, reader in textile physics, University of Leeds; G. R. de Beer, reader in embryology, University College, London; O. M. B. Bulman, university lecturer in palæozoology, Cambridge; Lord Cadman, chairman, Anglo-Iranian Oil Company; Gilbert Cook, regius professor of civil engineering and mechanics, Glasgow University; H. Davenport, lecturer in mathematics, University of Manchester; C. F. Goodeve, reader in physical chemistry, University College, London; F. G. Gregory, professor of plant physiology, Imperial College, London; A. C. Hardy, professor of zoology and oceanography, University College, Hull; C. H. Kellaway, M.D., director of the Hall Institute for Medical Research, Melbourne; K. S. Krishnan, Mahendralal Sircar, research professor of physics, Calcutta; R. P. Linstead, professor of organic chemistry, Harvard University; O. Maass, MacDonald professor of physical chemistry, McGill University, Montreal; H. S. W. Massey, Goldsmid professor of mathematics, University College, London; B. H. C. Matthews, assistant director of research, Physiological Laboratory, and Fellow of King's College, Cambridge; W. H. Pearsall, professor of botany, University of Sheffield; J. H. Quastel, biochemist to Cardiff Mental Hospital; A. Robertson, professor of mechanical engineering, Bristol University; L. F. Spath, lecturer in geology, Birkbeck College, University of London; and W. Sucksmith, reader in magnetism, University of Bristol.

The office of this society has returned to its rooms in Burlington House, London, W.1, and the library is to be reopened there.

Royal College of Physicians of London

At a meeting of the College on March 18, Sir Robert Hutchison, was re-elected president.

Diplomas were conferred jointly with the Royal College of Surgeons upon the following:

D.O.M.S.—S. C. Barory, S. G. Corner, D. J. H. Douglas, W. G. Hutton, A. B. Irani, C. S. Krishnamurthi, Laura H. Macfarlane, Howard Mallek, Dorothy Miller, R. L. Naylor, J. W. L. Price, A. C. Reid, S. N. Sen, K. H. Singh, and Peter Wilson.

D.T.M. & H.—Paul Baer, George Brecher, F. C. Collingwood, Shelton Durham, S. V. Garde, D. V. B. Levi, Eugene Nassau, P. L. Ottolenghi, Emanuel Seidenman, and Salehbhoy Tayebbhoy.

Royal College of Surgeons of England

At a meeting of the council of the College held on March 14 with Mr. Hugh Lett, the president, in the chair, the John Hunter medal and triennial prize were awarded to Dr. L. E. H. Whitby, for his research work in bacteriology with special reference to the sulphonamide compounds. Mr. Sampson Handley and Mr. W. H. Ogilvie were re-elected representative members of the council of the Imperial Cancer Research Fund, Mr. Eardley Holland was re-appointed as the representative of the college on the Central Midwives Board, and Mr. E. B. Dowsett, was appointed as the visitor of the college to the dental school of the Egyptian University for 1940.

Diplomas of fellowship were granted to the following:

R. H. F. Brain, M.B. Birm.; Herbert Spencer, M.B. Lond.; R. M. Paton, M.B. Lond.; H. W. Fuller, M.B. Lond.; A. K. Pardhy, M.B. Camb.; R. T. Johnson, M.B. Camb.; D. A. Richmond, M.B. Manc.; R. V. Coxon, M.B. Lond.; C. A. Schulenburg, M.B. Cape Town; N. G. Godfrey, M.B. Sydney; J. G. Brown, M.B. Melb.; A. J. Craig, M.D. Malta; J. S. Darling, M.B. Belf.; W. C. Gledhill, M.B. Sydney; R. A. Mogg, M.B. Wales; K. A. Moore, M.B. Sydney; A. H. Shaaban, M.B. Cairo; Jagdish Singh, M.B. Punjab; M. J. L. Stening, M.B. Sydney; A. E. Williams, M.B. Wales; Roger Wilson, M.D. McGill; and J. M. Yeates, M.B. Sydney.

Diplomas of membership were granted to the following:

J. M. Battersby, Univ. Coll.; H. A. Blackford, Birm.; Gerald Clayton, Manc. & Camb.; H. R. Hudd, Cardiff; W. L. R. Kenyon, Manc.; W. R. Lodewyke, Ceylon; L. J. Lopez-Garcia, St. Barts.; C. R. Morgan, Guy's; I. C. B. Pearce, Oxfd & Lond.; Barbara M. Sibbald, Roy. Free; Margaret E. A. Slater, Leeds; and W. P. Sweetnam, Manc.

Licences in dental surgery were granted to the following:

K. I. Badran, A. W. Barry, Andreas Biro, Ernst Bustin, R. S. Camrass, R. R. Darracott, W. F. Dunn, Roy Dunstan, M. W. Eirew, Arthur Forbes, Desiderius Fürst, R. D. Garthwaite, F. A. Gresham, W. R. Gunlack, T. S. Hicks, R. F. Hoar, I. H. Ingram, W. E. Jackson, E. C. Lewis, Margaret M. Moody, R. C. D. Morrell, C. J. C. M. Moyce, W. A. T. Parsons, J. A. Pearmund, J. O. Pierce, J. A. Pomeroy, G. E. A. Ralston, J. A. Reid, S. J. Rittermann, Irma W. Rivkine, F. J. L. Roberts, Karl Schajowicz, Moritz Schiller, Hugo Schneider, Bruno Schrötter, S. G. Sheffield, G. R. Styles, R. I. Speck, N. K. Thorn, J. S. Woodhead, and J. F. C. Wright.

Diplomas in tropical medicine and hygiene and in ophthalmic medicine and surgery were granted to the candidates named in the report of the Royal College of Physicians in this isue.

American Public Health Association

The 69th annual meeting of this association will be held in Detroit, Michigan, from Oct. 8 to 11. Dr. Reginald Atwater is executive secretary of the association, and may be addressed at 50, West 50th Street, New York City.

Holidays in War-time

The committee on workers' holidays set up by the Industrial Welfare Society under the chairmanship of Lord Amulree, state that they consider:

That an annual holiday contributes to the workpeople's happiness, health and efficiency;

That, if the workers are to meet the demands for war-time production without undue strain, a holiday, except in sudden or grave emergency, is more vital than in peace-time;

That, owing to the use of normal holiday accommodation for various war-time purposes, and the limitation on transport by road and rail, it is essential that holidays should be spread over the months of May to October if beneficial holidays are to be enjoyed.

The committee therefore appeal to local authorities, to employers and their representatives, to workpeople and their representatives, in the industrial districts, to arrange meetings at an early date to discuss local arrangements for bringing about a spread-over of the holiday period.

Sir Thomas Dunhill has been appointed consulting surgeon to the Australian Imperial Force.

University of Bristol

Dr. Margaret Morgan has been appointed registrar to the cancer research committee of the University.

Joint Tuberculosis Council

At a meeting of the council held on Feb. 17 the following officers were appointed for 1940: chairman, Dr. D. A. Powell (Welsh Nat. Memor. Assoc.); vice-chairman, Dr. Ernest Ward (Devon) and Dr. James Watt (Godalming); treasurer, Dr. G. Jessel (Lancashire); hon. secretary, Dr. J. B. McDougall (Maidstone).

Honour for Birmingham Doctor

On Sept. 18 Dr. Charles Parslow completed 50 years' service at The Queen's Hospital, Birmingham, and on March 5 his colleagues gathered to do him honour and present him with a gold watch. At the presentation Prof. J. G. Emanuel said he considered that Dr. Parslow was really the founder of antenatal clinics and postnatal welfare work in the city. He had created the obstetrical department at The Queen's.

French Honour

The King has given permission to Surgeon Lieut.-Commander A. N. Forsyth to wear the insignia of chevalier in the Order of Maritime Merit conferred on him by the French Republic. The order was given in recognition of his services to the survivors of the French steamer *Yolande* which was wrecked off the coast of China in 1938. Surgeon Lieut.-Commander Forsyth was gazetted surgeon-commander on Feb. 17, 1940.

National Heart Hospital, London

The outpatient department of this hospital, Westmoreland, Street, W.1 is now open on Monday, Tuesday and Wednesday mornings only. New patients should be sent not later than 9.30 A.M.

Appointments

ABRAHAMS, Sir ADOLPHE, M.D. Camb., F.R.C.P., physician to the Westminster Hospital.

BLACK, IRENE B., M.B. Lond., temporary deputy medical superintendent at Plymouth City Hospital.

FINE, JOSEPH, M.D. Glasg., D.P.H., part-time pathologist at the East Ham Memorial Hospital.

HINES, SHEILA G., M.B. Lond., part-time assistant school medical officer and assistant medical officer for maternity and child welfare at Wrexham.

MCMATH, W. F. T., M.D. Belf., M.R.C.P., D.P.H., medical officer of health for Barnes.

REES, HARLAND, B.M. Oxfd, surgical registrar at Charing Cross Hospital, London.

TWORT, R. J., M.B. Camb., medical registrar at the Royal Infirmary, Aberdeen.

WALKER, A. J., M.R.C.S., Wander scholar and registrar in the children's department of the Westminster Hospital.

Medical Diary

Week beginning March 25

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1

TUESDAY

Medicine, 4.30 P.M., Prof. John Ryle: The Prognosis and Treatment of Hyperpiesia.

THURSDAY

Urology, 5 P.M., Mr. J. A. Currie: Megalo-ureter; Mr. Thomas Moore: Sterile Pyuria. Discussion on Recently Introduced British Drugs and their Uses in Urology.

FRIDAY

Ophthalmology, 5 P.M., cases 5.30 P.M., Dr. G. T. W. Cashell: Malignant Change in Melanosis of the Conjunctiva.

EDINBURGH ROYAL INFIRMARY

THURSDAY—4.30 P.M., Dr. Lewis Thatcher: The Care of Children during War-time and Afterwards. (Honyman Gillespie lecture.)

PADDINGTON MEDICAL SOCIETY

THURSDAY—2.45 P.M. (First-aid Post, St. Mary's Hospital, W.2), discussion on the Treatment and Disposal of Cases at a First-aid Post.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1

Royal Cancer Hospital, Fulham Road, S.W.3, Mon. to Sat. 9.30 A.M., F.R.C.S. (final) course.—Medical Society of London, 11, Chandos Street, W.1, Thurs., 5 P.M., Mr. R. J. McNeill Love: Solid Viscera.

NOTES, COMMENTS AND ABSTRACTS

SUGAR IN MEDICINE

IN our correspondence columns the president of the Pharmaceutical Society appeals for economy in the prescription of preparations containing sugar. It is understood that this appeal is made at the special request of the Sugar Controller. Under normal circumstances the quantity of sugar allocated by the controller for pharmaceutical purposes this year—100 per cent. of the quantity estimated to have been used in 1939—would have been sufficient; but the severe weather in January and February this year and its accompaniment of coughs and colds led to an abnormal consumption of sugar-containing linctuses, lozenges and the like. Thus there was some encroachment on the balance of the sugar allocation for the remainder of the year and we must go carefully. Saccharin and glycerin can be used as alternative sweetening agents, but neither can take the place of sugar as a preservative or in increasing the density of liquids. The president refers to unsatisfactory alternatives used in the last war to which a return is undesirable. It would help prescribers to respond to his appeal if the Pharmacopœia Commission were to issue some emergency formulæ for sugar-free versions of standard preparations.

UP-GRADED SANATORIA

AT the first meeting of the Joint Tuberculosis Council since the outbreak of war, the prospect of new accommodation for tuberculosis came up for discussion on a memorandum by Dr. F. R. G. Heaf, who has his eye on the new pavilions providing some 6000 beds which have been added to existing T.B. institutions under the E.M.S. scheme. The pavilions, he thought, were too close together, too large and too poorly heated to provide ideal sanatorium wards, but they might well be used for chronic ambulant and advanced chronic cases, for minimal lesions, and as hostels and workshops for rehabilitation centres. These hutments must not remain as empty relics of war. They should form the nucleus of rehabilitation centres throughout the country and bring to reality a vision for which many had been working. Sir Wilson Jameson, for his part, felt that the ultimate destiny of this new accommodation should not be divorced from the regionalisation of public health activity for which he was working. The council should take note of efforts being made in other quarters to centralise medical work on a regional basis.

MACEWEN

Prof. Grey Turner's Macewen memorial lecture, which has now been printed along with some excellent photographs, is a reminder that Sir William Macewen was not only a great and tireless surgeon but an inspiring teacher whose message will last. Macewen graduated in 1869, the year Lister left Glasgow, and he died in 1924 at 76 still an operating surgeon. In 1890 when he became professor at Glasgow the only operating theatre at the Western Infirmary was used in the evenings for smoking concerts and antisepsis was the ritual of the day. Macewen's large fish-kettle for sterilising instruments was a joke among his friends but he insisted on asepsis and with him insistence meant accomplishment. All he did was done carefully, without haste and with thorough preparation and no new step in technique or treatment was undertaken until it had been put to experimental test. Macewen's work on bone, herniæ and pyogenic disease of the nervous system bears proof of the most careful industry and accurate observation.

Of the byways of Macewen's work it may surprise some to learn that in 1876 he diagnosed and located accurately a cerebral abscess and that in 1895 he performed a pneumonectomy when the thorax was still surgically sacrosanct. He treated bone sepsis with the minimum of disturbance and dressing and he knew the value of small pieces of bone rather than the massive grafts which became the fashion. Grey Turner has successfully followed Macewen's advice and safely replaced bone fragments in compound fractures of the skull, and he tells of a surgeon who boiled a large skull flap for 20 minutes to destroy neoplastic cells and then replaced the flap which healed without trouble. Macewen also emphasised the need to train patients, for example in operations where the capacity to swallow might be lost and tube feeding become necessary, before and not after the operation. Above all, he repeatedly criticised and tested the accepted dogma, made his failures a starting point for fresh effort and found in anatomy and pathology new and daily lessons.

OXYGEN THERAPY AT HOME

AT a meeting of the Liverpool Medical Institution on Feb. 22 Dr. A. G. C. ffolliott read a paper on oxygen-tent therapy in general practice, in which he showed that it is quite practicable to provide an atmosphere of pure oxygen in almost any private house. Most of these conditions for which oxygen therapy is beneficial are commonly treated by practitioners in patients' own homes. Of the various methods of administering oxygen used the only ones capable of producing an adequate percentage of oxygen in the alveolar air are the nasal mask and the oxygen chamber or oxygen tent. The large standard oxygen tent requires the constant supervision of a skilled attendant, which usually makes it unsuitable for use in general practice. The small emergency tent, however, is hardly less effective and can be used by any unskilled attendant, after a brief explanation. It possesses most of the advantages of the large tent and patients, even children, seldom object to it. The cost of the oxygen is now within the means of almost everyone. Dr. R. J. Minnitt described the use of the small oxygen tent as one of the most important methods of modern therapy that could be carried out by the general practitioner. Administration of oxygen by means of nasal tubes is, in his opinion, not to be compared with the tent, the reason being that the retained carbon dioxide in the latter ensures better absorption of the oxygen.

A WATER-JET AIR PUMP

MANY laboratory operations can be carried out more conveniently or rapidly if a source of negative pressure is available. The Bunsen water-jet pump seems to have been the earliest device of the kind for expediting filtration or for aspiration. The inconvenience of the long-fall tube necessary to get a fair vacuum led to the construction of various examples of the glass-blower's skill in which high-pressure water was used. The fragility of glass and the difficulty of exactly following a successful model led to its replacement by metal water-jet pumps, mostly of foreign manufacture. A British firm, well known for the production of high vacuums, has turned its attention to the manufacture of a pump which can be connected to a laboratory tap, either by rubber tubing or by the screw thread cut in the jet block. It is made of brass, chromium plated, with the parts readily detachable, and is a sound engineering job, likely to last. It is claimed that with a head of only 15 pounds per square inch, pressure is rapidly reduced to 12 mm. of mercury, and at 25 pounds a 3-litre container can be exhausted to 20 mm. of mercury in 4 minutes. Tests made with a pump placed at our disposal by the makers show that pressure is rapidly reduced to approximately that of water vapour. The makers, Messrs. W. Edwards, Allandale Works, Southwell Road, S.E.5, have certainly produced a pump which will be useful in laboratories where vacuum is not laid on. The price (14*s.*) is not excessive for so well made an article.

PROFESSOR DOMAGK ON CHEMOTHERAPY

AT a meeting of the Berlin Medical Society on Jan. 10, Professor Domagk read a paper on the experimental bases of the chemotherapy of bacterial infections with the sulphonamides and their derivatives.[1] He said that the sulphonamides must not be regarded simply as bacterial disinfectants, for in the usual disinfection tests in such fluid media as bouillon, water and serum the sulphonamides have shown no action or a very feeble action, much inferior to that of the best known disinfectants. When an intraperitoneal infection of the mouse with hæmolytic streptococci is studied under the influence of sulphanilamide or some other potent sulphonamide given by the mouth or by parenteral injection in sufficient doses, a peritoneal smear reveals no cocci whereas they are abundant in the controls. Though the dose of streptococci injected is many times a lethal one, the treated mice retain their general appearance of health. When from time to time after infection with streptococci the large monocyte cells and the leucocytes in the exudate are scrutinised, they often show large vacuoles in their protoplasm, indicative of phagocytosis and digestion of the injected cocci. This may at first sight suggest that sulphanilamide has exerted a non-specific stimulation on the phagocytes, but Professor Domagk has never known non-specific "reiztherapie" to have anything like as powerful an effect as this. The presence in the exudate of degenerated forms of cocci suggests that sulphanilamide has had a direct action on them. Professor Domagk went on to explain certain experiments with the freshly defibrinated blood of human beings, rabbits and guineapigs in contact with micro-organisms and sulphonamides which indicate that this group of drugs has a direct effect on invading germs. But there are certain sulphonamides whose action does not come into play outside the living organism, and many of them seem to be particularly active in certain structures, such as the reticulo-endothelial system, in which they succeed in coming into effective contact with the invading germs. The process of healing under sulphonamide treatment takes place in several phases which suggests that recovery depends on a certain coöperative reaction on the part of the organism. Hence the danger of delay till the organism has lost its power of reaction. With regard to dosage, Professor Domagk has found that large doses are necessary at first, particularly in such general infections as puerperal fever. A less heroic dosage is necessary in milder infections such as erysipelas. The disappointing results obtained in endocarditis lenta may depend on anatomical peculiarities, the drug not being able to penetrate in sufficiently high concentration to bacilli lodged in necrotic tissues ill-supplied with blood-vessels.

LING PHYSICAL EDUCATION ASSOCIATION

MANY of the association's members are now with the forces, either directing physical training in the women's organisations or serving with them. But the need for physical training and recreation is as great as ever and the majority of members are usefully continuing their work in schools, welfare centres and social organisations. In the annual report for 1939 the account of the visit of the British teams to the Lingiad in Stockholm and the Ling centenary dinner in London remind us of some of the things we have temporarily lost. In the meantime the association has changed over to war conditions and has brought out a pamphlet on ventilation in blacked-out halls. The report also includes the results of a questionnaire circulated to members of the association in June which shows that a regular medical examination is held during school hours in 80 per cent. of secondary schools, and that the children are examined annually between the ages of eleven and eighteen. The gymnastic mistress attends in 90 per cent. of the examinations but the parents are only invited to be present in 15 per cent. The inquiry into the conditions of childbirth of married gymnasts which the association is undertaking with the Medical Women's Federation was continued during the year, and it is hoped it will be completed this year.

Copies of the report may be had from the association at Hamilton House, Bidborough Street, London, W.C.1.

BUFOTHERAPY

THE poison of the toad was well known to the ancients, and it has enjoyed an intermittent reputation as a treatment for anything from snake-bite to dropsy. It was even one of the ingredients of the witches' brew in Macbeth:

> "Toad that under cold stone
> Days hath sweltered forty-one."

This poison, according to Dr. Scapier (*Paris méd.* 1939, **29**, 331), is a complex substance secreted by the ventral and dorsal glands and consists of bufotaline and bufotenine. Bufotaline, he says, acts on the heart and blood-vessels, and bufotenine on the nervous system. The action on the cardiovascular system is somewhat like that of adrenaline and of digitaline but more powerful, vasoconstriction and transitory hypertension with bradycardia being among its effects. Bufotenine acts as a paralysant or as a convulsant of nerves according to dose, and it can be used as an analgesic. Unlike those of other animals, the poison of the toad is not an offensive but a defensive weapon, making it unpleasant to eat and conferring immunity against the poison of insects, which form the toad's diet, and against toxins generally. The immunity is said to extend to the toad's spermatozoa and ova. The rarity of cancer in the toad, as compared with frogs and fishes, has led to the trial of toad venom in the therapy of cancer. Nevertheless Dr. Scapier has been able to produce new growths in toads by the application of methylcholanthrene and other carcinogens.

YOGA

BOOKS on Yoga are often obscure and deal with physiology in a highly symbolic way. In "The Yoga System of Health" (Faber and Faber. 1939. Pp. 116. 7*s.* 6*d.*) Mr. Yogi Vithaldas has tried to descend from these heights, and his exposition of the ancient cult is unusually clear. He has based upon it a practical system of exercises, which he illustrates by photographs of himself in the postures recommended. The aim of these exercises is to educate the abdominal, gluteal and lumbar muscles and the diaphragm so as to maintain a correct poise. They are said, in addition, to stimulate the vital nerve centres of the brain and spinal cord by facilitating an adequate supply of blood to these parts. It is pointed out, too, that the upright position is not conducive to a good blood-supply to the brain, and therefore standing on the head is advocated to improve cerebral circulation. A set of rhythmical breathing exercises is also described. Lastly the author explains the Yoga method of developing concentration and meditation. The enhancement of mental powers which may follow is explained by the theory of key energy or "Kundalini," of which the gist is that energy which is stored in the prevertebral plexus of the parasympathetic system is liberated by stimulation of this system. To the Western mind, however, the useful practice of introspection without help or control from a physician is sometimes regarded as impractical or even dangerous. Nevertheless, a study of Yoga by western psychologists is long overdue.

AIR PURIFICATION BY HYPOCHLOROUS ACID

THE Milton Proprietary Limited have devised an apparatus for purifying air by hypochlorous acid liberated from a solution of hypochlorite by the carbon dioxide of the air itself. Since this action is very slow when the hypochlorite solution is exposed in bulk to the air, owing to the relatively small air-liquid interface, the liquid is distributed into the air by spraying so that it issues in very small droplets

1. *Disch. med. Wschr.* Feb. 23, 1940, p. 203.

having an enormous surface relative to their mass. This is done by an electrically driven compressor which forces air into a vessel containing the hypochlorite via an atomising jet and a system of two hollow cones between which powerful vortices are formed leading to further break-up of the spray into minute droplets. The air containing the droplets in issuing from the apparatus draws with it a strong current of air from the surroundings, this being augmented by the action of a fan driven by the motor of the compressor. This Dynalysor, as the makers name it, is only 17 × 7 × 11 in. and can be adapted for alternating or direct current. Experimental evidence is adduced showing reduction of bacterial content in rooms following the use of the appliance. Naturally the time factor comes in. To achieve almost complete sterilisation of an occupied room with inoffensive concentrations of hypochlorous acid of the order of 1 in 10 million of air takes some hours, but, as would be expected, the greatest reduction occurs soon after spraying has commenced. No discomfort or annoyance was experienced by the many workers in the rooms used for the experiments.

Births, Marriages and Deaths

BIRTHS

EVANS—On March 18, at Windsor, the wife of Mr. E. Stanley Evans, F.R.C.S.—a son.

FAUX.—On March 11, at Bolton, the wife of Dr. F. R. Faux—a son.

HINDLEY.—On March 13, at Ruanda, Belgium Mandated Territory, the wife of Dr. G. Talbot Hindley—a son.

MILLIGAN.—On March 16, the wife of Dr. Peter Milligan, of Guildford—a son.

SALAMAN.—On March 14, at Stansted, Essex, the wife of Dr. A. G. Salaman—a son.

SMELLIE.—On March 15, at Woking, the wife of Dr. W. B. Smellie—a daughter.

MARRIAGES

CRITCHLEY—POPE.—On March 15, at Denmark Hill, S.E., Cyril Fletcher Critchley, F.R.C.S., Major, R.A.M.C., to Dorothy Sinclair Pope, M.D., of Crediton, Devon.

DAVIS—SMITH.—On March 5, Edwin Cosman Davis, Surgeon Commander R.N., to Muriel Vincent Smith, of Budleigh Salterton.

HART—LANSDELL.—On March 16, at St. Pancras Church, Edward Watson Hart, M.B., Captain, R.A.M.C., of Glasgow, to Peggy May Lansdell, of Bath.

SHEFFIELD—BEGBIE.—On March 16, at Portsea, Dennis Gerard Sheffield, M.B., Lieutenant, R.A.M.C., of Sevenoaks, to Henrietta Ruth Begbie, of Portsmouth.

DEATHS

FARR.—On March 14, at Cuckfield, Sussex, Conrad Charles James Farr, M.R.C.S., aged 69.

FISHER.—On March 13, at Dorchester, Frederic Bazley Fisher, M.R.C.S., aged 85.

FRIZELL.—On March 9, at Londonderry, William Alexander Frizell, L.R.C.P., aged 89.

GRAHAME.—On March 11, at Nantwich, Malcolm Claud Russell Grahame, M.B.Edin., aged 62.

LEE.—On March 12, Ronald Outram Lee, M.B. Camb., of Thame, Oxfordshire, aged 63.

MCWILLIAM.—On March 14, at Bournemouth, Alexander McWilliam M.B. Aberd., aged 84.

MARSHALL.—On March 10, at St. Austell, Frank Edgar Marshall, M.B. Lpool, of Pentewan, Cornwall, aged 67.

MEYRICK.—On March 16, in Middlesex Hospital, Ferdinand Richard Holmes Meyrick, M.D. Dubl.

OKELL.—On March 16, at Winsford, Cheshire, George Okell, L.R.C.P.I., aged 76.

OSWALD.—On March 11, Henry Robert Oswald, M.D. Edin., late coroner of the County of London.

RANSOME.—On March 14, at Birkenhead, Arthur Cyril Ransome, M.B. Camb.

RITCHIE.—On March 13, at Nelson, Lancs, Charles Ritchie, M.B. Aberd., aged 65.

RUSSELL.—On March 13, in Sydney, N.S.W., William John Russell, F.R.C.S.I., aged 84.

SLATER.—On March 15, at Tunbridge Wells, Charles Slater, M.B. Camb., aged 83.

VENTERS.—On March 13, in Edinburgh, Isabella Beattie Venters, M.B. Edin.

Vacancies

Basingstoke, Park Prewett Hospital.—Temp. deputy med. supt. £700.

Bedford County Hosp.—H.S., at rate of £155. Also cas. O., at rate of £150.

Birkenhead County Borough.—Asst. school M.O. and asst. M.O.H., £500.

Bradford Royal Infirmary.—H.P. to radium and skin depts., £200.

Brighton, Royal Sussex County Hosp.—Res. H.S.'s and res. cas. S. at rate of £150 and £120 respectively.

*British Postgraduate Medical School, Ducane Road, W.*12.—Cas. O., at rate of £150.

Burton-on-Trent General Infirmary.—Cas. O. and H.P., £150.

Buxton, Derbyshire, Devonshire Royal Hosp.—H.P., at rate of £150.

Cambridge, Addenbrooke's Hosp.—Res. anæsthetist and emergency officer, at rate of £130.

Canterbury, Kent and Canterbury Hosp.—H.S. to special depts., at rate of £125.

Derbyshire Royal Infirmary.—H.S. for cas. dept., £150.

Doncaster Royal Infirmary.—H.P., H.S., and H.S. to ear, nose, and throat and ophth. depts., each at rate of £150.

*East Ham Memorial Hosp., Shrewsbury Road, E.*7.—Temp. hon. radiologist, 3 guineas per session.

Folkestone, Royal Victoria Hosp.—Res. H.S., £130.

Gloucester, Gloucestershire Royal Infirmary.—H.S. to ear, nose, and throat dept., £170.

Hull Royal Infirmary.—H.S. to ophth. and ear, nose, and throat depts., at rate of £150.

Islington Metropolitan Borough.—Temp. M.O. (A.R.P.), at rate of £550.

*King Edward Memorial Hosp., Ealing, W.*13.—Res. M.O., at rate of £275. Also cas. O. and deputy res. M.O., at rate of £225.

Leicester Royal Infirmary.—H.S., at rate of £125.

Liverpool City.—Res. asst. M.O. for Cleaver Sanatorium, £250.

London County Council.—Temp. Asst. M.O. £250.

Manchester Ear Hosp., Grosvenor Square, All Saints'.—Res. H.S. and H.S., £120 and £150 respectively.

Manchester, Duchess of York Hosp. for Babies.—Sen. res. M.O., at rate of £125.

Margate, Royal Sea-Bathing Hosp.—H.S., at rate of £200.

Middlesex County Council.—Cas. M.O. for West Middlesex County Hosp., at rate of £350.

Newcastle-upon-Tyne, City Hospital for Infectious Diseases.—Temp. Jun. Res. Med. Asst. £250.

*Norwood and District Cottage Hospital, S.E.*19.—Hon. anæsthetist.

Nottingham General Hosp.—H.P., at rate of £150.

Oldham Royal Infirmary.—Res. surg. O., £400.

Plymouth City.—Res. surg. O. for Mount Gold Orth. and Pulmonary Tuber. Hosp., £300.

Portsmouth City.—Jun. res. M.O. for Saint Mary's Hosp., £250.

*Royal Chest Hosp., City Road, E.C.*1.—H.P., at rate of £200.

*Salvation Army, Mothers' Hosp., Clapton, E.*5.—Jun. res. M.O., at rate of £80.

Shrewsbury, Royal Salop Infirmary.—Res. H.S., at rate of £160.

South Shields, Ingham Infirmary.—H.S., £150.

Staffordshire County Council.—Second asst. bacteriologist and pathologist, £700. Also H.S. for Standon Hall Orthopædic Hosp., £200.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S., at rate of £150.

Swansea General and Eye Hosp.—Res. anæsthetist, at rate of £150.

*Victoria Hosp. for Children, Tite Street, Chelsea, S.W.*3.—H.P., at rate of £100.

Weston-super-Mare Hosp.—Res. H.S., £150.

The Lancet 100 Years Ago

March 28, 1840, p. 7.

From a lecture by Henry Ancell at the School of Anatomy adjoining St. George's Hospital.

Albuminous urine has been observed in acute febrile diseases, in scarlatina, both during the primary fever and the secondary anasarca, and in many chronic diseases, independently of renal lesion. It is now generally believed that this symptom occurs constantly in the anasarca which succeeds scarlet fever. With respect to these last cases, there is a dispute among pathologists not yet settled. It is asserted, on the one hand, that the kidneys must be uniformly diseased, and, on the other, cases are given in which after death the kidneys presented no appearance of organic lesion. However this may turn out, there seems to be no doubt that albuminous urine has coexisted with dropsy, disease of the heart, and " perfect soundness of the kidney " ; it has been observed also in anasarca concurring with bronchitis, diseased intestines, and healthy kidneys ; in a case of aortic aneurysm terminating fatally by rupture, in which the kidneys were sound ; and in a case of phthisis with chronic peritonitis and ulceration of the intestines, where the same circumstance was ascertained. In one and all of these cases there can be very little doubt that the albuminous state of the urine is attributable to a morbid condition of the blood. Again albuminous urine occurs in scurvy, purpura, and hæmorrhagic eruptive fevers; and an observation has been made by M. Rayer of the greatest importance, if it should be confirmed, to the effect that in these diseases the fibrin of the blood is at the same time diminished, and effusions of serum take place in the cellular tissue and on membranous surfaces.